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IN THE

SUPREME COURT OF THE UNITED STATES

October Term, 1984

EWP CORPORATION and
LA SOCIETE TREFILUNION,
Petitioners,

v.

RELIANCE UNIVERSAL INC., and
EXPOSIAC INDUSTRIES, INC.,
Respondents.

Petition for Writ of Certiorari to the United States Court of Appeals for the Federal Circuit.

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QUESTIONS PRESENTED

1. Is the Court of Appeals for the Federal Circuit subject to the review constraints established by this Court, including the "clearly erroneous" standard of FRCP 52(a) and the strong proscription against *de novo* fact finding reaffirmed recently by this Court in *Anderson v. Bessemer City*, 84 L.Ed.2d 518?

2. In a patent case, where the Court of Appeals for the Federal Circuit has exclusive appellate jurisdiction, and therefore cannot render a decision in conflict with a decision of another federal court of appeals on the same matter, are the conditions governing the grant of review on writ of certiorari under Rule 17 of this Court met when one panel of the Court of Appeals for the Federal Circuit has rendered a decision in conflict with decisions of other panels of that Court on the same questions?

3. Is it permissible for the Court of Appeals for the Federal Circuit to circumvent the applicable review constraints by stating that the "*approach*" of the District Court to the issue of nonobviousness (35 U.S.C. § 103) was "erroneous" without holding any of the fact findings by the District Court, including those relating to patent validity mandated by this Court in the *Graham* case, to be "clearly erroneous"?

4. Is the Court of Appeals for the Federal Circuit free to disregard the statutory presumption of validity (35 U.S.C. § 282) by failing to give effect both to the District Court's "detailed and careful analysis of the prior art" and to the "persuasive evidence" of nonobviousness which was held by the District Court to rebut the Defendants' evidence of obviousness that was rejected by the District Court as entitled to no weight because of lack of qualifications and bias of defendants' witness?

5. Did the Court of Appeals for the Federal Circuit err in failing to give effect to the District Court's findings of fact based on "convincing" objective evidence (secondary considerations) of nonobviousness by substituting its own speculative rationalizations having no basis of fact in the record?

RULE 21.1(b) AND 28.1 STATEMENTS

All parties to the proceedings below are listed in the caption of the case in this Court. Petitioner EWP Corporation is a wholly owned subsidiary of Price Brothers Company.

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PETITION FOR WRIT OF CERTIORARI

Petitioners ("EWP" and "Trefilunion") pray that a writ of certiorari issue to review the judgment of the United States Court of Appeals for the Federal Circuit (hereinafter the CAFC).

OPINIONS BELOW

The opinion of the United States District Court for the Southern District of Ohio is reported at 221 USPQ 542 and reproduced on Appendix pages A-19 — A-50. That Court held the single claim of Francois Patent No. 3,578,036 to be valid and infringed.

The opinion of the CAFC is reported at 755 F. 2d 898 and 225 USPQ 20, and is reproduced on Appendix pages A-1 — A-17. That Court reversed the District Court's judgment of validity and hence did not reach the infringement issues.

JURISDICTION

The judgment of the CAFC was entered on February 21, 1985. A timely petition for rehearing was denied by order dated April 4, 1985, a copy of which is reproduced on Appendix page A-18.

The United States District Court had original jurisdiction of this matter pursuant to 28 U.S.C. § 1338(a). The jurisdiction of this Court is invoked under 23 U.S.C. § 1254(1) and § 2101(c).

STATUTES AND RULES INVOLVED

In the interest of brevity, only the pertinent portions of the relevant statutes and rules are set forth below:

35 U.S.C § 103

A patent may not be obtained though the invention is not identically disclosed or described as set forth in sec-

tion 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

35 U.S.C. § 282

A patent shall be presumed valid . . . The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity.

Federal Rules of Civil Procedure

Rule 52(a). In all actions tried upon the facts without a jury . . . the court shall state the facts specially and state separately its conclusions of law thereon . . . Findings of fact shall not be set aside unless clearly erroneous, and due regard shall be given to the opportunity of the trial court to judge of the credibility of the witnesses.

STATEMENT OF THE CASE

This case places in clear perspective the need for this Court to review the practice of the CAFC of indulging in *de novo* fact finding contrary to the strong proscriptions against this practice repeatedly asserted by this Court.

The CAFC heard its first appeal in October of 1982, but the present case is at least the tenth petition for a writ of certiorari to that Court seeking relief from *de novo* fact-finding contrary to Rule 52(a). As discussed below on page 21, that total represents more than ten times the average frequency of petitions based on the same point with respect to the other twelve circuit courts of appeal in the same time period.

The present case is also of special significance because the decision of the CAFC represents a radical departure from the standards for determination of nonobviousness which that Circuit had established in prior cases. More specifically, in

appeals to the CAFC from district courts involving the issue of obviousness as to each of 65 patents, 16 out of 41 judgments of invalidity were reversed, and 23 judgments of validity were affirmed. Only in the present case did the CAFC reverse a judgment of validity of a district court sitting without a jury. In so doing:

(a) The CAFC made its own findings of fact with respect to each of the successive steps prescribed for trial courts in *Graham* v. *John Deere Co.*, 383 U.S. 1 (1966).

(b) After noting the "detailed and careful analysis of the prior art" by the trial court, the CAFC reversed the judgment of nonobviousness without setting aside the findings of fact on which it was based.

(c) The CAFC disregarded the statutory presumption of validity under 35 USC § 282, notwithstanding that (i) the trial court conducted an independent examination of the pertinent prior art and concluded that "Defendants' evidence fails to overcome the presumption of validity," and (ii) the trial court found "persuasive evidence" of nonobviousness which rebutted defendants' evidence on obviousness that the Court rejected as entitled to no weight because of lack of qualification and bias of defendants' witness on that subject.

(d) The CAFC violated its legislative mandate to "increase doctrinal stability in the field of patent law" (Senate Rep. 97-275) and "to reduce the widespread lack of uniformity and uncertainty of legal doctrine that exist in the administration of patent law" (HR Rep. 97-132) when — in conflict with its own precedents — it found the Francois patent obvious from the same prior art which the trial court found "dissimilar enough to render the Francois invention nonobvious" and in spite of the trial court's findings that:

> There is convincing evidence that the Francois invention filled a long-felt and serious need in the reinforced concrete pipe industry . . . (its) impact upon the American concrete pipe industry was immediate and extensive.

The Subject Matter In Issue

Francois patent No. 3,578,036 (App. pages B-1 — B-5) contains a single claim defining a method for producing steel wire mesh reinforcing cages for concrete pipe of the bell and spigot type, namely pipe which has an enlarged bell portion at one end that forms a socket for receiving the spigot end of the barrel portion of the next length of similar pipe in an installation of a line of such pipe.

The patent is owned by petitioner Trafilunion and is exclusively licensed to petitioner EPW, which acquired its license rights from its parent corporation, Price Brothers Company. Respondent Exposaic was formerly a sublicensee of EWP, and it was its cancellation of its sublicense — while continuing to manufacture and sell the essential component of the Francois invention — which led to the present litigation. Respondent Reliance is a customer of Exposaic and admitted direct infringement.

The Historical Facts

Concrete bell and spigot pipe incorporating a reinforcing cage made from welded wire mesh had been manufactured and used for many years prior to the Francois invention. The wire mesh was produced by steel fabricators; and manufacturers of concrete pipe would purchase that mesh in rolls, or sometimes in stacks of cut panels, and fabricate individual cages as needed for their pipe production.

The Francois invention as a whole starts with the provision of "expandable" pipe mesh, which differs from the convention pipe mesh by having one marginal strip portion formed of convoluted wires, the width of this strip being approximately equal to the axial dimension of the bell portion of the pipe in which it is to be used.

In making a cage for bell and spigot pipe from this mesh, a piece of proper length is rolled to cylindrical form, and the resulting circumferential wires are welded together with the convoluted wires at one end of the cage. These convoluted

wires are then stretched to elongate their convolutions and thereby to increase the diameter of their end portion of the cage to the appropriate dimensions to match the bell or socket portion of the pipe for which the cage is dimensioned, while leaving the major portion of the cage unaffected.

The District Court found that prior to the Francois invention, bell and spigot pipe reinforcing cages made from wire mesh were produced by a series of laborious manual steps, that this procedure gave rise to serious problems with the finished cages, and that:

> The difficulties with the latter (manual) methods were recognized as so serious that the Wire Reinforcement Institute, a trade association made up of wire mesh manufacturers, set up a special task force in 1967 to try to devise new means or methods for achieving a high degree of quality and uniformity with the use of wire mesh.

In 1969, a "study mission" of 30 American industry leaders, sponsored by the American Concrete Pipe Association, toured concrete pipe manufacturing facilities in Europe to observe their latest techniques. One member of that group was Emerson W. Heisler, Vice President of Price Brothers, who had been President of the Wire Reinforcement Institute when its "task force" was set up in 1967. The study mission visited a pipe plant in France which used the Francois invention, and the District Court quoted Heisler's testimony that:

> "It was almost like stumbling over gold or something. It looked so much like the answer to a long festering problem."

Heisler ascertained that the mesh which he saw at the pipe plant was manufactured by petitioner Trefilunion, and he promptly began negotiations with Trefilunion which resulted in the acquisition by Price Brothers of exclusive license rights to the Francois invention in the United States.

Price Brothers at that time was the only U.S. company which manufactured both pipe mesh and concrete pipe. It began to use the Francois invention early in 1971, and it also began offering sublicenses to other manufacturers of pipe mesh in the summer of 1971. The District Court found that within several years, virtually every United States manufacturer (including respondent Exposaic) of wire mesh for bell and spigot pipe sought and obtained a license, under which it paid royalties on its sales of "expandable" mesh and extended to its customers the right to use that mesh in practicing the Francois invention. The District Court also noted that:

> Heisler testified that as of the time of the trial, he knew of no United States manufacturer of pipe mesh for bell and spigot pipe which did not use the Flexicage method, and that Exposaic is the only such manufacturer which does not pay royalties thereon under the Francois patent. *No evidence to the contrary was offered by the defendants.* (emphasis added)

During the three and one-half years while its license was in force, Exposaic reported more than $2,500,000 in net sales. During the subsequent period from March of 1979 through the calendar quarter ending in September of 1983, Exposaic's net sales of the expandable pipe mesh totalled more than $11,000,000.

The Proceedings Below

The defendants conceded before trial that Reliance directly infringed the Francois patent by using expandable wire mesh purchased from Exposaic to practice the claimed method. The only issues at the trial, therefore, were the validity of the Francois patent under 35 U.S.C. § 103, and whether Exposaic, by reason of its manufacture and sale of the mesh to Reliance, was liable for inducement of infringement and for contributory infringement.

The only witness for the defendants on the issue of ob-

viousness was the president of Exposaic, Howard Woltz, as to whom the trial court stated:

> Mr. Woltz . . . has no formal education in science or engineering. Because of Mr. Woltz' lack of qualifications and potential bias, the Court gave no weight to his opinion.

In rebuttal, the plaintiffs called their technical expert, Dr. Walter Starkey, as to whom the trial court found:

> Dr. Starkey was well qualified to express an opinion on this issue (obviousness) by reason of his extensive education and experience.

The Court of Appeals noted that the trial judge "made what appears to be a detailed and careful analysis of the prior art." The trial judge found that the most pertinent reference not considered by the Patent Office was a 1940 German patent, but that:

> . . . To the extent the references relied on by defendants are pertinent, they are sufficiently dissimilar from the subject matter of the patent in suit to render the latter nonobvious. Defendants' evidence fails to overcome the presumption of patent validity. Moreover, the conclusion that the Francois patent was nonobvious is persuasively supported by the expert testimony of plaintiffs' rebuttal witness and by relevant secondary considerations.

The judgment of the District Court was that the Francois patent was valid, that the pipe-making defendant Reliance was liable for direct infringement, and that the mesh-producing defendant Exposaic was liable for both inducing and contributory infringement.

The Decision of the CAFC

The CAFC reversed the trial court's judgment of validity and did not reach the infringement issues. In so doing, the CAFC duplicated every successive step taken by the trial court according to *Graham*, *supra* page 3. More specifically, the majority slip opinion comprises 17 pages wherein the "Background" section covers 10 pages and is devoted to *de novo* fact-finding with respect to the disclosure of the Francois patent and the scope and content of the prior art.

This "Background" section closely parallels the fact-findings of the trial court, without finding any error other than to criticize the trial court for concentrating on that portion of French patent 1,474,698 which related to concrete pipe rather than on other parts of the disclosure which related to products other than pipe, e.g. concrete construction elements such as beams.

Then in its "Opinion" section, the CAFC substituted its own interpretation of the evidence for that of the trial court, and held that the Francois invention should have been obvious from the same 1940 German patent which had been considered by the trial court and plaintiffs' expert as the closest reference, notwithstanding the unchallenged evidence that it had not been obvious, during the 30 years following publication of that reference, to those men of extensive experience in the wire reinforcement art who, as members of the Wire Reinforcement Institute, set up a task force in 1967 to deal with the problem which was not solved until the Francois invention became available in 1971.

The only basis for the holding of the CAFC (since it failed to find any findings "clearly erroneous") was that the trial court's *"approach"* to the obviousness issue was in error because that "approach seems to regard the invention as tied to the making of concrete bell and spigot pipe and to appraise the pertinence of each reference individually on that basis." Assuming that the CAFC's characterization of the trial court's "approach" is accurate, it is clear from the Francois patent

that the trial court's "approach" was correct. (See the title, the drawings, the specification Col. 1, lines 5-8, 43-61 and Claim 1 on Appendix pages B-1, B-3, B-5)

REASONS FOR GRANTING THE WRIT

The decision of the CAFC is in conflict with directly applicable decisions of this Court defining the standard of review for appellate courts, and this case represents at least the tenth occation where this Court has been petitioned to correct *de novo* fact finding by the CAFC in the less than three years of its existence. (See page 21 below.)

The present decision is also in such conflict with prior CAFC decisions on the issue of obviousness, under 35 U.S.C. § 103 and *Graham* v. *John Deere Co.*, 383 U.S. 1 (1966), as to do violence to its legislative mandate to

> increase doctrinal stability in the field of patent law (by) providing for uniformity of doctrinal development in the patent area. (Senate Rep. 97-275)

If this decision is not reversed by this Court, it will introduce serious confusion into the most important issue in patent law — the determination of what constitutes a nonobvious (patentable) invention — and also into the application of the presumption of validity under 35 U.S.C. § 282.

Petitioners submit further that if this decision is not reversed, the district courts — and also the participants in the patent system — will be left with directly conflicting guidance as to the standards of patentability which the CAFC expects them to apply.

I. The *De Novo* Fact Finding by the CAFC

It is anomalous that a comprehensive discussion of this issue by this Court in *Zenith Radio Corp.* v. *Hazeltine Research, Inc.*, 395 U.S. 100, 123 (1960), was quoted by the CAFC less

than one year before its decision in the present case, in *Preemption Devices, Inc.* v. *Minnesota Mining and Mfg. Co.*, 732 F.2d, 903, 905 (Fed. Cir. 1984):

> In applying the clearly erroneous standard to the findings of a district court sitting without a jury, appellate courts must constantly have in mind that their function is not to decide factual issues de novo. The authority of an appellate court, when reviewing the findings of a judge as well as those of a jury, is circumscribed by the deference it must give to decisions of the trier of the fact, who is usually in a superior position to appraise and weigh the evidence. The question for the appellate court under Rule 52(a) is not whether it would have made the findings the trial court did, but whether "on the entire evidence [it] is left with the definite and firm conviction that a mistake has been committed."

In a more recent case, *Inwood Laboratories, Inc.* v. *Ives Laboratories, Inc.*, 456 U.S. 844, 857 (1982), this Court restated and applied the same principle:

> . . . An appellate court cannot substitute its own interpretation of the evidence for that of the trial court simply because the reviewing court might give the facts another construction . . .

This Court was even more specific in its very recent decision in *Anderson* v. *Bessemer City*, 470 U.S. ____, 84 L.Ed.2d 518, (March 1985):

> If the district court's account of the evidence is plausible in light of the record viewed in its entirety, the court of appeals may not reverse it even though convinced that had it been sitting as the trier of fact, it would have weighed the evidence differently. Where there are two permissible views of the evidence, the fact finder's choice between them cannot be clearly erroneous . . . (page 528)

> The rationale for deference to the original finder of fact is not limited to the superiority of the trial judge's position to make determinations of credibility. The trial judge's major role is the determination of fact, and with experience in fulfilling that role comes expertise. Duplication of the trial judge's efforts in the court of appeals would very likely contribute only negligibly to the accuracy of fact determination at a huge cost in diversion of judicial resources. . . . For these reasons, review of factual findings under the clearly-erroneous standard — with its deference to the trier of facts — is the rule, not the exception. (page 529)

The CAFC has vacilated unpredictably between honoring these principles and ignoring them. See, for example, *Rosemount, Inc.* v. *Beckman Instruments, Inc.*, 727 F.2d 1540, 1543 (Fed. Cir. 1984):

> Beckman misconceives the role of an appellate court and the nature of the appellate process. The court does not sit to consider evidence *de novo*, and the appellate process is not a mere academic exercise. . . .
>
> Appeals in patent cases should not be mere games played with pieces of paper called references and the patent in suit. Lawsuits arise out of the affairs of people, real people facing real problems. So here, the technical problem out of which grew the present litigation was real. It was solved by inventor Cardeiro.

What *Rosemount* at another point called the "real-world history" of the Cardeiro invention is also so closely comparable to the present case that if "Francois" were substituted for "Cardeiro" in the last quoted sentence, the entire passage would apply here. In each case, there was a continuing history of industry problems which the invention solved, there was commercial adoption of the invention by the entire industry, and finally there was a challenge to the patent — in the present case by a licensee which cancelled its license but

continued its use of the invention. Yet by the same sort of "duplication of the trial judge's efforts" (page 529) and "de novo weighing of the evidence in the record" (page 530) which this Court condemned in *Anderson*, the CAFC reached a conclusion diametrically opposed to that of the trial court and to its own precedents in *Preemption Devices* and *Rosemount*.

Outstanding examples of *de novo* fact finding by the CAFC include the following:

> Having considered the careful analysis of the prior art by the district court and the briefs in this court, we set forth below *what appears to us to be the prior art most relevant* to the method claimed in the patent in suit. (emphasis supplied).
>
> The other most relevant prior art, *in our view*, is French patent 1,474,698 . . . . (emphasis supplied)

These "what appears to us . . most relevant" and "in our view" *de novo* determinations of the scope and content of the prior art — entirely independent of the trial court's "careful analysis of the prior art" — together with detailed discussion of the Francois invention and of the German and French patents which it selected as the most relevant prior art occupy more than one-half of the CAFC majority opinion.

Further, the designation by the CAFC of the French patent as the "other most relevant prior art" was in spite of the fact that the defendants themselves had not considered the French patent to be of sufficient relevance to include among their top three references. It would be hard to find a better example of the "duplication of the trial judge's efforts in the court of appeals" which this Court decried in *Anderson*, *supra* page 10.

As another example of its *de novo* fact finding, the CAFC stated that:

> The trial court properly undertook to decide upon the level of ordinary skill in the art, (but) . . it clearly erred

> in assuming that the involved art is making reinforced concrete products. Considering the invention here claimed, we see it as a narrower field: the making of reinforcing wire cages and the like.

The trial court's finding as to the "involved" art is supported by the title, the specification, the drawings and the sole claim of the Francois patent. It also had a firm basis in the defendants' admission that the claim had been directly infringed by the maker (Reliance) of the reinforced concrete pipe — not by the maker of the reinforcing mesh. The trial court's finding on this point therefore had direct support in the record, while the contrary finding by the CAFC was clearly contrary to the evidence.

In summary, the CAFC retraced each of the first three fact-finding steps of *Graham*, *supra* page 3: first by *de novo* determining "what appears to us to be the prior art most relevant," next by *de novo* finding that the differences which the trial court found between that art and the claimed method were irrelevant, and then by substituting its own erroneous *de novo* finding for the trial court's finding that the art to which the Francois method claim pertains is that art wherein direct infringement of that claim occurs. Indeed, as discussed beginning on page 18 below, it even second-guessed the trial judge as to the "evidentiary value" of his findings on the secondary considerations of *Graham*.

Clearly, the CAFC did precisely what *Inwood Laboratories*, *supra* page 10, said that it could not do: "substitute its interpretation of the evidence for that of the trial court."

II. The CAFC Violated the "Clearly Erroneous" Requirement of Rule 52(a)

As this Court pointed out in *Inwood Laboratories*, the "clearly erroneous" standard of Rule 52(a) "recognizes and rests upon the unique opportunity afforded the trial court

judge to evaluate the credibility of witnesses and to weigh the evidence." The CAFC itself stated this principle very clearly in *Preemption Devices, supra* page 10:

> It behooved appellant, therefore, to precisely point out and demonstrate why the finding of the trial court, on any issue it argued, was *clearly* erroneous, not merely that we *might* reach a different conclusion on a de novo review. We are not in as good a position as was the trial judge to evaluate conflicting evidence or even to judge the true significance of documentary and physical exhibits introduced through or testified about by live witnesses who appeared before him. (732 F.2d 905; emphasis in original)

In the present case, the trial court took full advantage of the opportunity to evaluate the credibility of the only witness offered by the defendants on the issue of obviousness, as well as of the expert rebuttal witness for plaintiffs. Indeed, the CAFC expressed "full agreement" with the trial court's analysis of the Francois invention and selection of the 1940 German patent as the most pertinent prior art reference relied on by defendants.

The one respect in which the CAFC attempted to find error in the trial judge's "approach to the issue" of non-obviousness was that he "clearly erred in assuming that the involved art is making reinforced concrete products" rather than "the making of reinforcing wire cages and the like." Not only was this criticism unjustified for the reasons already pointed out on pages 12-13, but it was erroneous in two other respects.

First, the 1940 German patent, which was the primary prior art basis for the CAFC's decision, relates specifically to the making of reinforced concrete pipe. Further, the trial court inherently found that the Francois invention had not become obvious in either art, and had firm support for that finding in the fact that 27 years after the German patent

issued, the Wire Reinforcement Institute — composed of persons of much more than "ordinary" skill in the "involved" art designated by the CAFC — was still so concerned with the problems of bell and spigot cages that it appointed a special task force to seek their solution.

Petitioners respectfully submit that the rationale of the CAFC in attempting to find error by the trial judge provided a typical example of what it had itself termed "games played with pieces of paper called references and the patent in suit." *Rosemount, Inc., supra* page 11.

III. The Decision Below Effectively Repealed the Statutory Presumption of Validity

The first paragraph of 35 U.S.C. § 282 (supra, page 2) established two principles. A patent is to be presumed valid. And the burden of establishing invalidity rests on the party asserting it. There is also solid authority[1] for the proposition that

> the presumption is further strengthened on appeal where, as here, the trial court conducted an independent examination of the pertinent prior art and concluded that the patent was validly issued.

Prior to the present case, the CAFC had been highly consistent in requiring application of the statutory presumption by the district courts, as evidenced by the above-noted fact that although it has reversed 16 out of 41 judgments of obviousness, this is the first occasion in 24 cases where it reversed a judgment of nonobviousness of a district court sitting without a jury.

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[1] *Omark Industries, Inc.* v. *Textron, Inc.*, 688 F.2d 1242, 1246 (9th Cir. 1982); *Speedshore Corp.* v. *Denda*, 605 F.2d 469 (9th Cir. 1979); *Saf-Guard Products Inc.* v. *Service Parts Inc.*, 532 F.2d 1276, 1271 (6th Cir. 1976) cert. denied, 429 U.S. 896 (1976); *Farr Company* v. *American Air Filter Co.*, 318 F.2d 500, 502 (9th Cir. 1963), cert. denied 375 U.S. 903 (1963).

The contrast between the decision in the present case and the standards which the CAFC previously stated for itself is dramatic. Thus in reversing a judgment of invalidity as to two patents in *Jones* v. *Hardy*, 727 F.2d 1524, 1528 (Fed. Cir. 1984), the CAFC said:

> . . . The statute places the burden of providing facts establishing invalidity on the person asserting invalidity. The patent challenger must establish those facts by clear and convincing evidence, and the ultimate burden of persuasion never shifts from the patent challenger.

Similarly, in *Jamesbury Corp.* v. *Litton Industrial Products, Inc.*, ____ F.2d ____, 225 USPQ 253 (Fed. Cir. 1985):

> This court has repeatedly held that the facts leading to a conclusion of invalidity must be established by clear and convincing evidence. (citation) This standard is unvarying.

In the present case, the decision of the CAFC shows no consideration of either the statutory "burden of proving facts establishing invalidity" or its own "unvarying" standard that "the facts leading to a conclusion of invalidity must be established by clear and convincing evidence."

These omissions are especially significant because the only evidence which the defendants offered on the issue of obviousness consisted of copies of the nine prior art documents discussed by the trial court, and the opinion testimony of their witness Woltz to which the trial court gave no weight as noted above on page 7.

In contrast, the CAFC paid no apparent attention to the trial court's findings as to the patent owner's rebuttal evidence:

> . . . . . The question of obviousness can be stated in a more specific way: Would it have been obvious to a person of ordinary skill in the art, who is presumed to have been familiar with the German patent and the other per-

> tinent art of record in 1968, that the method disclosed in the German patent could be modified to prefabricate a tubular lattice reinforcement having a socket of increased diameter at one end?
>
> In the opinion of plaintiff's expert rebuttal witness, Walter Starkey, Ph.D., the answer to the above question is "no". Dr. Starkey was well qualified to express an opinion on this issue by reason of his extensive education and experience . . . Dr. Starkey supported his opinion with extensive analysis of the prior art relied on by defendants. His conclusions were substantially in accord with the Court's own findings. He considered the question of obviousness in this case in light of 13 separate factors, and concluded that the Francois invention would not have been obvious to an average workman skilled in the pertinent arts and sciences.
>
> . . . . . .
>
> Of course, the Court is not bound by Dr. Starkey's conclusion on the issue of obviousness, and would be obliged to reject it if the Court's independent examination of evidence indicated that his conclusion is erroneous. However, the Court agrees that the prior art relied on by defendants was dissimilar enough to render the Francois invention nonobvious.
>
> . . . Defendants' evidence fails to overcome the presumption of patent validity.

Where, as here, the CAFC mentioned no respect in which the patent challengers sustained their "burden of proving facts establishing invalidity . . . by clear and convincing evidence," and where also, as here, the trial court's judgment of validity was based on "persuasive evidence" of nonobviousness, as well as its own independent examination of the same prior art which the CAFC found most pertinent, the reversal of the trial court's judgment of validity was clearly contrary both to the statute and to the CAFC's own precedents.

IV. The CAFC Violated its own Standards for Consideration of the Objective Evidence of Nonobviousness

The antithesis of the present case is *Simmons Fastener Corp.* v. *Illinois Tool Works, Inc.* 739 F. 2d 1573 (Fed. Cir. 1984), in which this Court denied certiorari on April 29, 1985. In reversing the trial court's holding of invalidity for obviousness, the CAFC cited a series of its prior decisions on obviousness and quoted from several, including the following from *Stratoflex, Inc.* v. *Aeroquip Corp.*, 713 F.2d 1530 (Fed. Cir. 1983):

> Evidence rising out of the so-called "secondary considerations" must always when present be considered en route to a determination of obviousness . . . Indeed, *evidence of secondary considerations may often be the most probative and cogent evidence in the record. It may often establish that an invention appearing to have been obvious in light of the prior art was not.* It is to be considered as part of all the evidence, not just when the decisionmaker remains in doubt after reviewing the art. (Emphasis by the Court)

On this and other cited authorities, the CAFC in *Simmons* explained its reversal of the holding of obviousness as follows:

> We agree with the trial court that the teachings of the prior art prima facie would have suggested to one of ordinary skill in the art the claimed invention. . . . However, the evidence of secondary considerations in this case, particularly commercial success, is extremely strong, and is entitled to great weight.

Similarly in *Fromson* v. *Advance Offset Plate, Inc.*, 755 F. 2d 1549 (Fed. Cir. 1985), which was decided on the same day as the present case, another panel of the CAFC explained its reversal of the trial court's finding of obviousness as follows:

> . . . Objective evidence ("secondary considerations"), such as commercial success due to the merits of the in-

> vention, must when present be considered as part of the obviousness equation. The district court erred here in reaching a conclusion on obviousness before considering the evidence of secondary considerations, and in then evaluating the latter solely on its "gap filling" capacity.

Notwithstanding the directions given to the district courts by these precedent decisions, the CAFC in the present case did not touch on secondary considerations until it had reached "the conclusion that Francois did no more than apply the presumed knowledge of the art to provide an obvious solution to a simple problem. . . ." Even then, it could point to nothing erroneous in any of the trial court's findings on secondary considerations, which the concurring opinion summarized as follows:

> (a) "convincing evidence" that the invention involved here "filled a long felt and serious need in the reinforced concrete pipe industry;"
>
> (b) this invention had a strong impact on that industry (in this country) in that "virtually every manufacturer of wire mesh" for this kind of pipe not only sought and obtained a license but also abandoned prior art methods of bending and welding bells in reinforcement cages; and
>
> (c) there was sufficient motivation and effort toward discovering a new method but this was not accomplished for a considerable period of time.

In sharp contrast to these trial court findings and its own precedents, the CAFC attempted to deprecate both the findings and the evidence on which they were based:

> When, as happened here, the PTO issues a patent because the examiner did not consider prior art teaching the very technique essential to the claimed invention . . . it is not unusual to see astute businessmen capitalize on it by erecting a temporarily successful licensing program. Such programs are not infallible guides to patentability. They sometimes succeed because they are mutually

> beneficial to the licensed group or because of business judgments that it is cheaper to take licenses than to defend infringement suits, or for other reasons unrelated to the unobviousness of the licensed subject matter. Such a "secondary consideration" must be carefully appraised as to its evidentiary value and we have tried to do that here.

Clearly, the CAFC was far beyond the limits of its proper scope of review when, without setting aside any of the trial court's findings, it decreed that the factual base for those findings "must be carefully appraised as to its evidentiary value" and assumed for itself the responsibility for such careful appraisal instead of recognizing that it is the trial judge who "is usually in a superior position to appraise and weigh the evidence." *Zenith Radio*, *supra* page 9. And who, in the present case, had most meticulously carried out the responsibility for that appraisal based on the facts, in contrast with the highly speculative appraisal by the CAFC.

Not only was this a clear instance of *de novo* fact finding, but the resulting speculative findings were clearly erroneous in two major respects:

> 1. The "astute businessmen" who ran the wire mills took licenses because their pipe making customers wanted the benefits of the Francois invention, and created a demand for the special expandable mesh which could be obtained only from licensed wire mills.
>
> 2. As for the "temporarily successful" licensing program, the CAFC knew that every wire mill in the country made that special mesh, and that the demand for it was so strong and continuous that during just the ten calendar quarters immediately preceding the decision of the District Court, Exposaic had sales of its infringing mesh totalling over $7,000,000.

In summary on this point, in *Simmons* and all of its predecessors cited therein, the CAFC has been consistent in

requiring that any evidence of secondary considerations must be considered as a part of the decision making process on the issue of obviousness. Indeed, it went so far in *Simmons* as to rule that even where the teachings of the prior art *prima facie* would have suggested the claimed invention, strong evidence of secondary considerations justified a conclusion of nonobviousness.

Yet in the present case, the CAFC reached a premature conclusion of obviousness in spite of the trial court's finding that there were differences from the prior art which were enough in themselves to render the invention nonobvious, and then sought to justify that conclusion by arguing around the trial judge's findings that his conclusion of nonobviousness was "persuasively supported" by expert testimony and "by relevant secondary considerations."

The conflict between this case and *Simmons* leaves in a shambles the guidance to the trial courts with respect to evidence of secondary considerations which had previously seemed to be so clear from the series of cases leading up to *Simmons*.

V. The *De Novo* Fact Finding Record of the CAFC

In *Raytheon Co.* v. *Roper Corp.*, No. 83-2128, (cert. denied, 105 Sup. Ct. 127), the attention of this Court was called to six other then co-pending petitions for writs of certiorari urging that the CAFC had "engaged in impermissible fact-finding in abuse of Rule 52(a)."

In *Valmet Oy et al* v. *Beloit Corp.*, No. 84-1664 (cert. denied, June 10, 1985), the petition includes a "Comparative Analysis" (see copy reproduced here on Appendix page A-51) representing that out of 92 petitions from decisions of the CAFC in a little over two years, no less than 9 (9.8%) had complained of *de novo* fact finding, as contrasted with an average of only 1% for the other twelve circuits. The present petition raises that total to 10 and the percentage to over 10%.

Attention is also called to a very recent commentary on the record of the CAFC entitled "Patent Update: The Road to Uniformity and its Potholes" presented by George Whitney at the Southwestern Legal Foundation Annual Institute on Patent Law on April 18 and 19, 1985. Selected pages from that paper are reproduced on Appendix pages B-6—B-24, and special attention is called to the following portions:

> I find concern in the fact that the Federal Circuit remanded in only 3 of 135 district court appeals and in only 2 of 149 PTO appeals. Since the Federal Circuit reversed either in whole or in part 42 times (36%) in the district court cases and 30 times (20%) in the PTO cases, I respectfully suggest that they have gone a long way to create the perception that in the zeal to be result oriented, they have arrogated the roles of trial judge and jury.
>
> . . . . . .
>
> It is becoming increasingly clear that the result the Court seeks is not necessarily a "pro-patent" approach. Rather, it appears that the Court is attempting to give itself the latitude to decide cases whichever way it feels most strongly, regardless of the established standards of review which have traditionally guided the federal circuit courts.

Strong support for these conclusions is provided by the dissenting opinions of Judge Kashiwa in *Jones* v. *Hardy*, 727 F.2d 1524, 1534 (Fed. Cir. 1984) and *Baginsky* v. *United States*, 697 F.2d 1070, 1077 (Fed. Cir. 1983), cert. denied 104 S.Ct. 423 (1983), reh. denied 104 S.Ct. 987 (1984). Surely such criticism from within the CAFC itself merits close examination by this Court, especially in conjunction with the evidence provided by the statistics of Appendix page A-51 of a clearly discernible trend of repeated transgression by the CAFC of its proper appellate function by engaging in *de novo* fact finding.

CONCLUSION

Three times in the past three years,[2] this Court has found it necessary to admonish a Circuit Court of Appeals for failure to follow its explicit instruction as most recently stated in *Anderson*:

> (R)eview of factual findings under the clearly-erroneous standard — with its deference to the trier of fact — is the rule, not the exception.

In spite of those admonitions to other circuits, however, the CAFC seems to feel that it is free to ignore the "rule" as stated in *Anderson* whenever that rule interferes with its penchant for deciding cases whichever way it feels most strongly. How else can one explain the 10 to 1 ratio between the CAFC and the other circuits in petitions for certiorari based on a plea of de novo fact finding at the appellate level?

Twice in three years, this Court found it necessary to correct misapprehension and misapplication of the clearly-erroneous standard in one of the other circuits to the same issue involving the Civil Rights Act, i.e. in *Pullman-Standard* and *Anderson*. Petitioners plead that the record of the CAFC for similar violation of that standard — in an area of law where it alone among the circuits has appellate jurisdiction — cries out for timely correction which only this Court can make. As is pointed out in the Whitney paper (Appendix B-23, B-24):

> The danger facing patent practitioners is that the CAFC has taken on the role as the final arbitor, yet the panel of judges is different in nearly every case. While the Supreme Court has certainly had conflicting opinions, each decision specifically shows whether the Court is united, sharply divided, or somewhere in between the two. The weight of their authority is measurable.

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[2] *Pullman-Standard* v. *Swint*, 456 U.S. 273 (1982); *Inwood Laboratories*, *supra* p. 10; and *Anderson*, *supra* p. 10.

> Such is not the case with the CAFC, yet it has been the final word in patent cases since its inception in October 1982. The longer the Supreme Court waits to review a patent case, the greater the impact of the CAFC line of cases becomes. If the Supreme Court affirms a CAFC decision, the CAFC's power to decide cases whichever way it wants will be greatly increased. In order to reverse a holding of the CAFC, the Supreme Court is faced with the prospect of having to overrule, in effect, the CAFC's approach to a long line of patent decisions.

Since the CAFC now has exclusive appellate jurisdiction in patent cases, it cannot render a decision on a question specific to patent law which is in conflict with the decision of another federal court of appeals on the same question, in the context of Rule 17.1(a) of this Court. However, in view of the provision of Rule 17.2 in respect to the CAFC, petitioners plead that the facts and issues as discussed above fully meet the general considerations of Rule 17, in that the decisions rendered by the particular CAFC panel in the present case is in conflict with decisions of other panels of the CAFC on each of those issues, in addition to its conflict with applicable decisions of this Court.

Petitioners further plead that these facts and issues are so simple and so clear as to make the present case an ideal vehicle for the sorely needed exercise of this Court's power of supervision through review on writ of certiorari as sought by this petition.

Respectfully submitted,

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UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT
Appeal No. 84-711

EWP CORPORATION, and
LA SOCIETE TREFILUNION,
Plaintiffs-Appellees,

v.

RELIANCE UNIVERSAL INC., and
EXPOSAIC INDUSTRIES, INC.,
Defendants-Appellants.

DECIDED: February 21, 1985

Before RICH, DAVIS, and BALDWIN, *Circuit Judges.*

RICH, *Circuit Judge.*

This appeal is from the judgment of the United States District Court for the Southern District of Ohio entered after a bench trial, holding the single method claim of U.S. Patent No. 3,578,036 (Francois or '036 patent) valid and Exposaic Industries, Inc. (Exposaic), liable for both contributory infringement and inducement to infringe under 35 USC 271(c) and (b), respectively. 221 USPQ 542. Direct infringement by Reliance Universal Inc. (Reliance) under § 271(a) was admitted. We reverse.

Background

EWP Corporation is an Ohio corporation and a wholly-owned subsidiary of Price Brothers Company, a major manufacturer of reinforced concrete pipe, machinery for mak-

ing pipe, and wire mesh used as reinforcing material in concrete pipe. La Societe Trefilunion, assignee of the Francois patent in suit, is a French corporation, operating in France, and is also a manufacturer of wire reinforcing mesh.

Appellant Exposaic is a North Carolina corporation that manufactures welded wire mesh intended for use as reinforcing material for concrete products, including concrete pipe, but it does not itself manufacture concrete pipe. Appellant Reliance is an Ohio corporation that manufactures concrete pipe and purchases wire mesh reinforcing material from Exposaic.

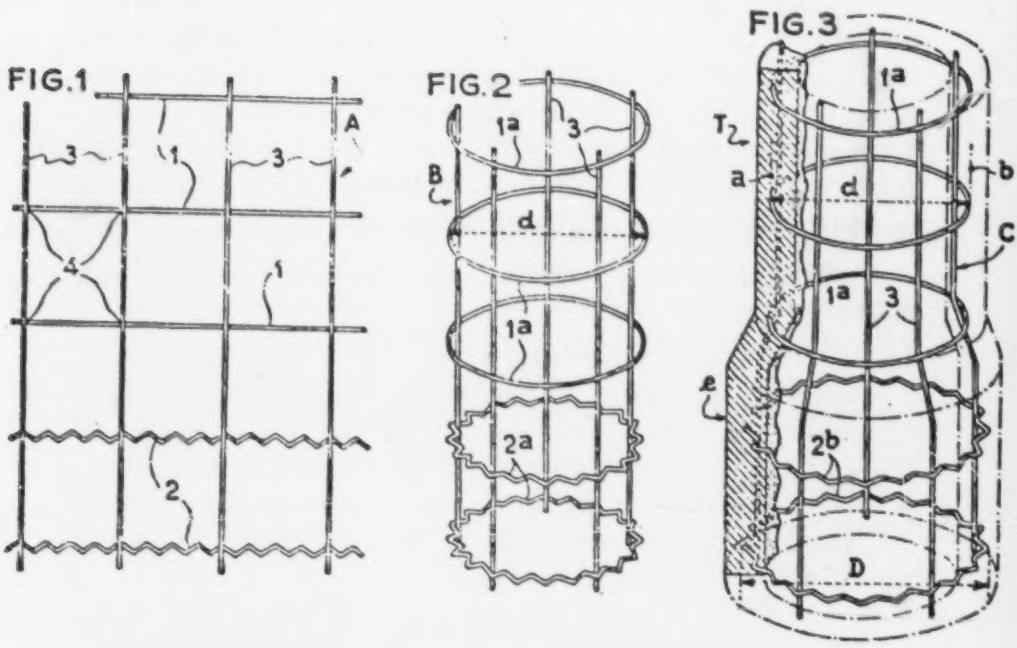
EWP is the exclusive licensee of Trefilunion with the right to grant sublicenses and to bring suit in its own name against any infringer of the '036 patent, which is entitled "Lattice for the Reinforcement of Tubular Concrete Elements Having a Socket[,] Method for Producing Said Lattice and the Products Obtained." It discloses a method for producing wire mesh reinforced concrete pipes having a socket or bell that forms a flared end suitable for mating with the straight end of an adjacent pipe and the product produced thereby but claims only the method of producing the wire reinforcement.

The single claim of the patent reads:

> A method for producing a reinforcement having a socket for a reinforced concrete tubular element having a socket, from a lattice having warp wires and weft wires and wherein a number of the warp wires have successive deformed non-rectilinear protions, the deformations of said portions being permanent and such that, upon exertion of tensile stress thereon, said portions can be at least partially straightened, whereas the other warp wires and all the weft wires are rectilinear, said method comprising, in a first stage, forming a prereinforcement by bending and closing onto themselves, in the form of welded rings, the transverse wires of a section of said lattice, said section being such that the transverse wires corresponding to the socket, and only these wires, have a succession of permanently deformed nonrectilinear portions so that

they have an apparent perimeter equal to the perimeter of the nondeformed transverse wires of the rest of the prereinforcement but a real length substantially greater than said perimeter, then, in a second stage, radially expanding the prereinforcement so as to elongate at least partially said nonrectilinear portions of the transverse wires of its socket and impart thereto an apparent perimeter which is substantially greater thatn that of the rest of the prereinforcement and corresponds to that of the desired socket of the reinforcement.

Figures 1, 2, and 3 of the '036 patent are reproduced below:



As shown, the flat lattice or mesh A of Fig. 1 has warp wires 1 and 2 and weft wires 3 intersecting at right angles and being welded together at their intersections. This lattice is bent and welded into a cylindrical form, or prereinforcement, shown as B in Fig. 2. Transverse circular rings 1a and 2a are formed from the warp wires 1 and 2 of the mesh. Warp wires 2a have

convolutions, corrugations, or other nonrectilinear portions such that these rings can be expanded in diameter, by use of appropriate apparatus, and undergo an increase in circumference as shown in Fig. 3. The claimed method is thus a procedure for producing such a reinforcement cage. Fig. 3 also shows in section a portion of concrete pipe T poured and molded aroung the cage, thereby forming a pipe with a tubular body having a mean diameter *d*, extending from *a* to *b*, and a socket portion *e*.

The preamble section of the patent specification states that reinforcing concrete pipe with welded wire lattices was known but that, with respect to reinforcing the socket portion, since the "best steels do not have sufficient elongation characteristics to permit a large expansion without fracture," two situations existed. First, reinforcement of the socket portion had been avoided or, second, reinforcements had been made in two parts, one for the pipe body and a wider part for the socket, the two parts being connected by wires. The patentee's invention is then described, in summary fashion, by the following language which closely resembles that of the claim:

> The object of the present invention is to overcome these drawbacks.
>
> The invention provides a lattice of welded metal wires wherein a number of the warp wires have successive deformed nonrectilinear portions, the deformations of said portions being permanent and such that, upon exertion of tensile stress thereon, said portions can be at least partially straightened whereas the other warp wires and all the weft wires are rectilinear.
>
> Owing to their deformed portions, which may form folds, waves, fractions of a coil or any other sinuosities or convolutions, it is possible to elongate the corresponding warp wires and the lattice can undergo, in the portion pertaining to these wires, an expansion in the direction in which the warp wires extend.

After expanding extensively on this broad statement of the invention, the specification then explains the conversion of the

lattice into the finished reinforcement for a section of concrete pipe as follows:

> Now, let is [sic] be assumed that it is required to construct a reinforcement for a concrete tubular element T having a socket *e* (Fig. 3). There is cut from the lattice according to the invention a section A (Fig. 1) whose dimensions correspond to the [sic] those of the reinforcement to be embodied in this pipe or tubular element T. This section can be cut at the site of construction of the pipes from a roll of lattice or in a factory and delivered to the site in the flat condition.
>
> * * *
>
> The section A of lattice is bent and welded in the form of cylindrical blank or prereinforcement (b) (Fig. 2).
> * * *
>
> * * *
>
> In order to change from the cylindrical prereinforcement B shown in Fig 2 to the final reinforcement C shown in Fig. 3, the prereinforcement B is mounted on a [sic] expanding machine for expanding the rings 2a. *This expansion is achieved by means of a known apparatus*, such as an expansible mandrel controlled by hydraulic pneumatic or mechanical means and inserted in the rings 2a.
>
> By means of it is [sic] apparatus, only the corrugated rings 2a are expanded and undergo both a mechanical circumferential elongation owing to the straightening of the corrugations or other deformations and an intrinsec [sic] elongation, that is an elongation in the fibers of the metal. [Emphasis ours.]

After this expansion step (the "second stage" of the method claim), the convoluted wire rings 2a of Fig. 2 become the similar but somewhat less convoluted wire rings 2b of Fig. 3 of enlarged diameter.

In the prosecution of the application for the patent in suit in the Patent and Trademark Office (PTO), the examiner cited only two prior art references, a Laswell patent and a Whitacre et al. patent, neither of which is relied on in this suit with respect to the validity of the claim in suit. The latter patent is on a machine for making welded, helical wire, pipe or post reinforcement cages capable of making cages of varying diameter. Laswell is even farther afield, being a wire structure used as spacer in composite, metal, vehicle floor panels not made of concrete. The patent does clearly disclose, however, the technique of first crimping a wire reinforcement and thereafter lengthening the wire by putting the crimped wire under tension to remove the crimp.

Having considered the careful review of the prior art by the district court and the briefs in this court, we set forth below what appears to us to be the prior art most relevant to the method claimed in the patent in suit.

German patent 694086 was issued (ausgegeben) 25 July 1940 and received in the U.S. PTO November 12, 1940. It relates to the making of hollow reinforced concrete bodies such as pipes, among other things, containing longitudinal iron reinforcing rods which are connected together by "transverse reinforcements." Figs. 1 and 2 of the patent are reproduced:

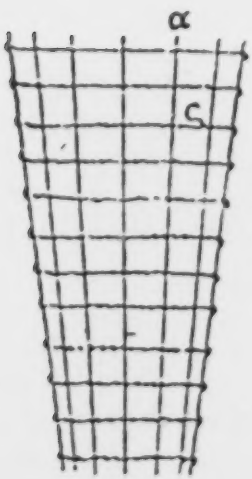


Abb. 1

Abb. 2

Fig. (Abb.) 1 shows reinforcing "cage wires," to use appellees' term, *a* being the longitudinal wires and *c* the "transverse reinforcement, consisting of corrugated spiral wire." In other words, the transverse member *c* is a "corrugated wire" wrapped spirally around the long wires *a*. In the process described in this patent, a hollow member such as a pipe is made of two layers in a mold. First, an outer layer is formed and the cage is placed inside it and then pressed outwardly — expanded — by a mandrel or "press core" into the first layer of wet concrete. The process is shown in Figs. 5 and 7, redrawings of which we take from appellees' brief:

FIG-5

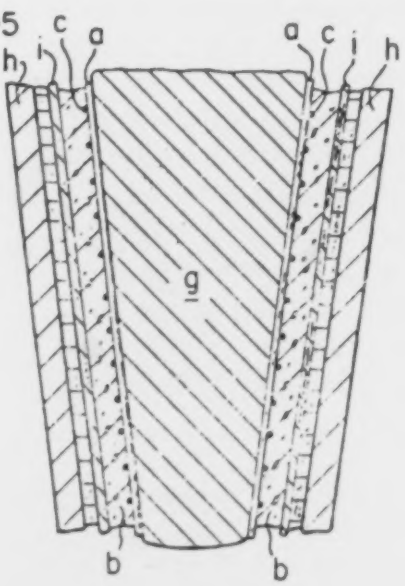


FIG-7

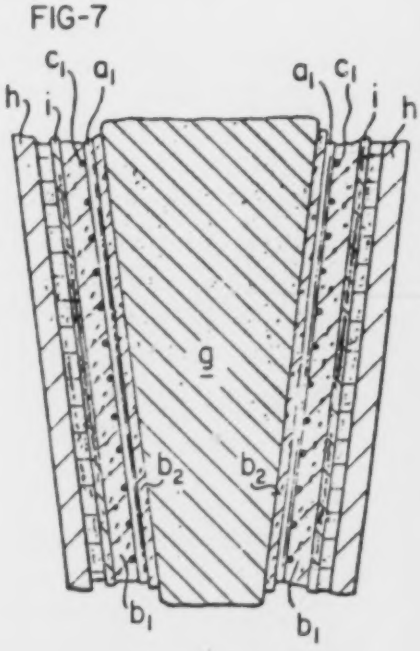


Fig. 5 shows a lined mold *h* — *i*, a first layer of concrete *b* and the cage elements *a*, *c*. The cage is being pressed outwardly into the concrete *b* by a tapered mandrel *g*. Fig. 7 shows the same after cage *a*, *c* has been expanded and a second layer of concrete b_2 laid over and pressed into it by the mandrel. The patent says *g* is a "press core which is conically or cylindrically extensible." It also states, significantly for this case, "it is essential for the new invention to use *extensible transverse*

reinforcements [*c*] which connnect the long iron inserts [*a*]." (Our emphasis.) And again, "The process consists in that after formation of the outer concrete wall, the reinforcing rings * * * corrugated overall are expanded by internal pressure without springing back, upon which the internal concrete wall is formed."

The other most relevant prior art, in our view, is French patent 1,474,698 issued to the German firm, Sudweststahl G.m.b.H., entitled "Lattice Reinforcement for Reinforced Concrete Construction" and disclosing a wide variety of reinforcing elements or structures which may be prefabricated and "permitting modification of the distance between reinforcing bars within determined limits." Below are some of the more pertinent illustrations followed by related statements from the specification:

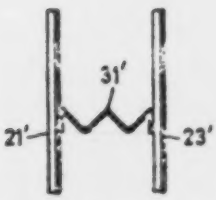


FIG. 10

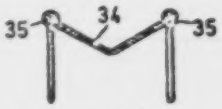


FIG. 11

FIG. 17

FIG. 14

FIG. 15

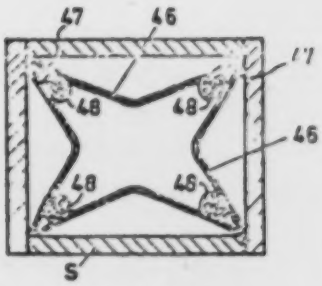


FIG. 16

In the above figures, longitudinal reinforcing members are shown at 21′, 23′, 35, 44, 48, and transverse or linking wires having a variety of bends, undulations, or zigzags *to permit extension* at 31′, 34, 42, 43, and 46. The following general statements are from the specification:

> According to the invention, two or more reinforcing elements, such as mutually parallel bars, are interconnected such that a lateral displacement of these bars with respect to each other is possible *to match the reinforcing element to the desired dimensions*; for transportation requirements, the individual elements can be compressed such that the bars touch each other.
>
> The linking elements are flexible but nevertheless rigid enough. They are composed of wires or strips which can be welded to the reinforcement bars, crimped, tied, or fixed in some other appropriate manner, for example by means of a movable sleeve or by another like piece.
>
> *The linking elements*, in the form of wire or of flat strips, maintain the bars at a controllable and determined mutual spacing, and *can likewise have one or more folds, i.e., can be folded in a zigzag form so as to be more or less stretched according to the desired distance between the reinforcing bars to be connected together*
>
> * * *
>
> *In place of zigzag linking elements provided with folds, it is possible to utilize spiral linking elements* which, in their length, can be extended or compressed to a greater or lesser extent in order to keep the reinforcing bars at the predetermined desired distance. [Emphasis ours.]

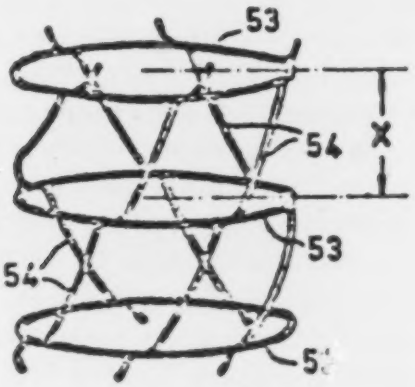
Although diametrical expansion of reinforcement rings is not expressly disclosed, the use of the reinforcements for pipe was not remote from the thinking of this patentee. The following appears:

> To reinforce *pipes*, a reinforcing element according to the invention can likewise be used. In such an element, the

closed rings, mutually parallel and embodied as reinforcing bars, are kept together by the linking elements such that the distance between the rings can be regulated to a determined value, preferably by twisting them. [Emphasis ours.]

Fig. 19, below, is a reinforcing element for pipes as described in the preceding paragraph. Having no crimped wires, it is not particularly relevant here, but is included for completeness.

FIG. 19



In discussing this reference, the trial judge, closely tracking the testimony of appellees' professorial patent expert witness, Dr. Starkey, instead of applying the more relevant teachings of this patent to the issue of obviousness, concentrated on Fig. 19 because it related to pipe. He then found "significant differences" between the Francois invention and the invention of French '698 saying the latter has "flexible 'linking elements'," whereas Francois has "no linking elements as such," although the crimped wires of Francois shown as 2, 2a, and 2b, supra, link the longitudinal, initially parallel wires 3 which, *in the words of French '698*, "can be . . . more or less stretched according to the desired distance between the reinforcing bars." Compare Figs. 2 and 3 of the patent in suit, supra, where the lower ends of the bars 3 have been moved farther apart by stretching the crimped wires from the 2a to the 2b size. It is

not Fig. 19 that is significant in this case, but the other clear teachings of the reference. The "expert" testimony misdirected the court's thinking.

OPINION

The Obviousness Question

Whether the single claim of the Francois patent in suit is valid under 35 USC 103 is a question of law and that question is freely reviewable by this court. *Graham* v. *John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966); *Gardner* v. *TEC Systems, Inc.*, 725 F.2d 1338, 1344, 220 USPQ 777, 782 (Fed. Cir. 1984). The PTO examiner did not cite the German or French '698 patents against the '036 patent application. Therefore, in considering obviousness, we have no PTO view before us on obviousness in view of those references and appellants' burden of proof under 35 USC 282 is more easily carried. *American Hoist & Derrick Co.* v. *Sowa & Sons, Inc.*, 725 F.2d 1350, 1359, 220 USPQ 763, 770 (Fed. Cir. 1984). It is our view that the claim is invalid because its subject matter would have been obvious to a person having ordinary skill in the wire reinforcement art at the time the invention was made.

The district judge made what appears to be a detailed and careful analysis of the prior art and, indeed, we agree with much of it, including his discarding of several prior art references on various grounds as lacking pertinence. The bases of our disagreement are few but fundamental and fairly simple. In explaining them we shall discuss only the most relevant prior art references and the teachings of the Francois patent itself. Speaking generally, the district court's opinion, in its discussion under the heading "II. Nonobviousness," takes what we deem to be an erroneous *approach* to the issue in comparing the Francois invention with the prior art. In the first place, the approach seems to regard the invention as tied to the making of concrete bell and spigot pipe and to appraise the pertinence of each reference individually on that basis. As we view the *method* of the single claim in suit, however, it is

not a method of making concrete pipe, of bell and spigot type or otherwise, notwithstanding the reference in the claim to "reinforced concrete." The method pertains only to making a wire reinforcement of tubular or cylindrical form, an end portion of which can be enlarged in diameter, if desired, by stretching.

A major portion of the "prior art," under § 103 is actually recited in the Francois patent.* It is there explained that "It is already known to employ a lattice for reinforcing concrete tubular elements . . . ." For what is meant by the term "lattice," see Fig. 1, supra. It is next stated that "the best steels do not have sufficient elongation characteristics to permit a large expansion without fracture." That is to say, the lattice, made into tubular form and welded, cannot be stretched *enough* to fit bell and spigot pipe without breaking some circular wires. That was the problem faced by Francois. His solution was to include in the part of the lattice he wished to enlarge "a number of warp wires [which] have successive deformed nonrectilinear portions." With them, the patent states, "it is possible to elongate the . . . warp wires and the lattice can undergo, in the portion pertaining to these wires, an expansion in the direction in which the warp wires extend." To produce the desired expansion, the cylindrical cage (Fig. 2) is "mounted on a [sic] expanding machine . . . . This expansion is achieved by means of a known apparatus such as an expansible mandrel . . . ."

It would be going too far, as a matter of patent law, to agree with appellants' brief that the "solution to the problem of wire breakage would seem to be dictated by the most elementary common sense." But we can say the solution would have been obvious to the hypothetical person of ordinary skill postulated

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* Appellee's brief makes the same point in arguing that the *best* prior art was therefore before the PTO. But it must be considered, under § 103, in conjunction with art that was *not* before the PTO in deciding whether the claimed invention would or would not have been obvious — a legal conclusion which is not based on the operation of Francois' brain but is the court's appraisal of what would have been obvious to one of ordinary skill in the art aware of the disclosures of *all* of the prior art.

by 35 USC 103 if we find evidence of prior art which shows he would have been presumed to know that the way to make a reinforcing wire expansible is to corrugate or crimp it. *See Kimberly-Clark Corp.* v. *Johnson & Johnson*, 745 F.2d 1437, 1449, 223 USPQ 603, 614 (Fed. Cir. 1984). German patent 604,086 is such evidence and further evidence is provided in French patent '698. We can express full agreement with the following statement in the trial court's opinion:

> It cannot be denied that the Francois invention is strikingly simple. Yet, simple and obvious are not synonymous terms. It is perceived that the invention depends for its successful operation upon two simple principles: a steel wire of a given length can be deformed or bent into a smaller apparent length, and then later be stretched back closer to its original length; and further, if the deformed wire is bent into a circle before it is stretched, the stretching will result in a circle with a larger diameter. Of all the prior art references relied on by defendants, the German '086 patent clearly exhibits the greatest similarity to the Francois invention. As noted, the German patent discloses a wire lattice reinforcement for concrete whose circumferential wires are corrugated, and thus "extensible." The German patent, like the Francois patent, then discloses the use of a mandrel to exert radial force upon these circumferential wires for the purpose of stretching them and expanding their circumference. These aspects of the German patent and the Francois patent are thus, in principle, the same.

What the law requires us to disagree with is the trial court's disregard of the clear *teaching* of the German patent to corrugate or crimp wires which one wishes to expand or stretch because of "significant differences" it found "between the German *invention* and the Francois *invention*." (Our emphasis.) That was the erroneous approach of appellees' expert witness. The court said, "Unlike the Francois patent, the German patent discloses nothing with respect to the formation of a socket or bell. All of the circumferential wires are corrugated . . . to

the same extent." And so on. Such differences are irrelevant. A reference must be considered for everything it *teaches* by way of technology and is not limited to the particular *invention* it is describing and attempting to protect. On the issue of obviousness, the combined teachings of the prior art as a whole must be considered.

We cannot escape the conclusion that Francois did no more than apply the presumed knowledge of the art to provide an obvious solution to a simple problem: use crimped wire where there is a need in a subsequent forming step to expand or stretch it. That presumed knowledge was, of course, available to all. It is irrelevant whether or not Francois was aware of it. Patentability under the statute, § 103, is a decision made on the basis of a hypothesis: Would the invention have been obvious "to a person having ordinary skill in the art to which the subject matter pertains" in the light of all knowledge conveyed by "prior art" as defined by statute and case law. It is a decision which must be made by courts because the law assigns that task to them. The function of witnesses, expert and otherwise, is to assist the court in determining and comprehending facts.

The trial court properly undertook to decide upon the level of ordinary skill in the art, a point upon which neither party introduced evidence. In doing so, it clearly erred in assuming that the involved art is making reinforced concrete products. Considering the invention here claimed, we see it as a narrower field: the making of reinforcing wire cages and the like. We mention it only because the view that concrete technology is involved seems to have been the basis for finding several references not pertinent because they did not relate to concrete pipe or, even more specifically, bell and spigot pipe. This was a ground for effectively ignoring the relevant teaching of the German patent because the *concrete body* was different, made by a different process, and "there is no disclosure of a socket of increased diameter at one end." That is of no moment. Its significance is in its teaching that when a wire reinforcing cage is to be expanded, the wires undergoing stretching should be crimped or, in the words of the claim in suit, provided with

"successive deformed non-rectilinear portions," which means the same thing.

In reaching our conclusion that the invention claimed would have been obvious, we have considered the evidence and arguments pertaining to the so-called "secondary considerations" such as commercial success, licensing, adoption by the industry, etc. Upon full consideration of all the evidence, we remain convinced that it presents a clear and very strong case of obviousness based on admissions and the teachings of the new references above considered.

When, as happened here, the PTO issues a patent because the examiner did not consider prior art teaching the very technique essential to the claimed invention — crimping of wire which is to be stretched later — it is not unusual to see astute businessmen capitalize on it by erecting a temporarily successful licensing program thereon. Such programs are not infallible guides to patentability. They sometimes succeed because they are mutually beneficial to the licensed group or because of business judgments that it is cheaper to take licenses than to defend infringement suits, or for other reasons unrelated to the unobviousness of the licensed subject matter. Such a "secondary consideration" must be carefully appraised as to its evidentiary value and we have tried to do that here.

Concluding that the patent is invalid under § 103, we deem it unnecessary to reach the other issues of infringement, inducing infringement, contributory infringement, damages, etc.

For the foregoing reasons, the decision below is *reversed*.

REVERSED

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

Appeal No. 84-711

EWP CORPORATION, and
LA SOCIETE TREFILUNION,
Plaintiffs-Appellees,

v.

RELIANCE UNIVERSAL INC., and
EXPOSAIC INDUSTRIES, INC.,
Defendants-Appellants.

DAVIS, *Circuit Judge*, concurring:

I join Judge Rich's opinion but write separately because of the need to explain more in detail why, to my mind, the "secondary considerations" do not in this case outbalance the "clear and very strong case of obviousness based on admissions and the teachings of the new references" (as the majority opinion properly puts it). The District Court found (a) "convincing evidence" that the invention involved here "filled a long felt and serious need in the reinforced concrete pipe industry"; (b) this invention had a strong impact on that industry (in this country) in that "virtually every manufacturer of wire mesh" for this kind of pipe not only sought and obtained a license but also abandoned prior art methods of bending and welding bells in reinforcement cages; and (c) there was sufficient motivation and effort toward discovering a new method but this was not accomplished for a considerable period of time.

Appellants correctly point out that these findings (particularly those as to the supplanting of prior methods) are overstated, but there can be no doubt that the invention of the '036 patent became very successful and has been much used. Nevertheless, I agree that this ample fulfillment of need does not prevail to show non-obviousness. First, as Judge

Rich's opinion shows, the invention was very, very clearly foreshadowed by the pertinent teachings of the German and French patents. Second, it seems to me not significant (though the trial court thought it very important) that the invention "wasn't developed sooner." The simple fact probably is that those teachings of the German and French patents were actually not well-known even in the pertinent art, but under the settled rule of § 103 that fact is irrelevant — they were still part-and-parcel of the prior art even if they were not in fact well-known in the United States; they are an integral part of the "*presumed*" knowledge. To me, this lag between "actual knowledge" and "presumed knowledge," not legal non-obviousness — together with the consideration mentioned by Judge Rich near the end of his opinion — adequately explains the delay in the utilization of the invention. Third, the quick acceptance of the invention, once it was disclosed in this country, should be explained on the same basis. If the pertinent teachings of the German and French patents had been widely circulated to the wire reinforcement art in this country immediately after those patents issued abroad, I judge that the invention at issue would have been made very much earlier and would have attained like success. These are the reasons, in my view, why the "secondary considerations" fail to overcome the very strong case of obviousness from the admissions and the teachings of the references considered in the prevailing opinion.

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

No. 84-711

EWP CORPORATION,

Appellee,

v.

RELIANCE UNIVERSAL, INC., ET AL.,

Appellant.

ORDER

A petition for rehearing and a suggestion for rehearing in banc having been filed in this case,

UPON CONSIDERATION THEREOF, it is Ordered by the court that the petition for rehearing be, and the same is hereby, Denied.

The suggestion for rehearing in banc is declined.

FOR THE COURT

/s/ GEORGE E. HUTCHINSON,
Clerk

April 4, 1985
Date

cc: John D. Nies
Nathaniel R. French

IN THE UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF OHIO
EASTERN DIVISION

C-2-79-1131

EWP CORPORATION, et al.,

Plaintiffs,

v.

RELIANCE UNIVERSAL, INC., et al.,

Defendants.

OPINION AND ORDER

(Filed November 4, 1983)

Plaintiffs EWP Corporation and La Societe Trefilunion brought this action against Exposaic Industries, Inc., and Reliance Universal, Inc., for infringement of United States Patent No. 3,578,036, the subject of which is a particular method of producing a steel reinforcement for concrete pipe. Defendant Reliance Universal, Inc. concedes that it uses the patented method in its pipe manufacturing business. Defendant Exposaic Industries, Inc., which manufacturers and sells a special type of welded steel wire mesh used in the patented method, denies that it induces or contributes to infringement. Both defendants allege as an affirmative defense that the patent is invalid.

The trial of this matter was had before the Court sitting without a jury. The issues for trial, as formulated by the pleadings, pretrial orders and opening statements of counsel, were three:

(1) Whether the single claim of United States Patent No. 3,578,036 is invalid for obviousness;

(2) If the patent is valid, whether defendant Exposaic Industries, Inc., has induced or contributed to its infringement; and

(3) If either defendant is liable for infringement, whether such infringement was willful so as to permit an award of punitive damages.

The parties have agreed that an assessment of damages will be made only after the Court orders defendants to make an accounting, assuming a finding of infringement. On the issues tried, the Court herein sets forth its findings of fact and conclusions of law in accordance with Federal Rule of Civil Procedure 52(a).

I. BACKGROUND

This action is based upon the alleged infringement of the single claim of United States Patent No. 3,578,036, invented by Maurice Francois, a citizen of France [hereinafter, the "Francois patent"]. The Francois patent was issued on May 11, 1971, on an application filed May 18, 1969, which was entitled to the priority date of French application Serial No. 144,908, filed March 22, 1968. Its title is "Lattice for the Reinforcement of Tubular Concrete Elements Having a Socket, Method for Producing Said Lattice, and the Products Obtained." Legal title to the Francois patent is vested by assignment in plaintiff La Societe Trefilunion. Plaintiff EWP Corporation has the exclusive license thereunder, with the right to grant sublicenses and to bring suit in its own name against any infringer of the patent.

Plaintiff La Societe Trefilunion [hereinafter, "Trefilunion"] is a body corporate under French law having its offices and principal place of business in Saint Dozier, France, and it is a manufacturer of wire mesh used as reinforcing material in concrete pipe.

Plaintiff EWP Corporation [hereinafter, "EWP"] is a corporation of the State of Ohio and is a wholly owned subsidiary of Price Brothers Company; both companies have their offices

and principal places of business in Dayton, Ohio. Price Brothers Company is a major manufacturer of reinforced concrete pipe, machinery for making concrete pipe, and wire mesh used as reinforcing material in concrete pipe.

Defendant Exposaic Industries, Inc. [hereinafter, "Exposaic"] is a corporation of the State of North Carolina. It manufactures welded wire mesh intended for use as reinforcing material for concrete products, including concrete pipe, but it does not itself manufacture concrete pipe.

Defendant Reliance Universal, Inc. [hereinafter, "Reliance"] is a corporation of the State of Ohio. It manufactures concrete pipe and purchases wire mesh reinforcing material from defendant Exposaic. Reliance and Exposaic have no corporate relationship; however, Exposaic has agreed to indemnify Reliance for any liability and expenses that Reliance may incur arising from a claim of alleged infringement of the patent in suit.

The subject matter of the Francois Patent is a method for producing steel wire reinforcing cages for concrete pipes, and specifically, reinforcing cages made from steel wire mesh fabric for pipe of the bell and spigot type wherein each length of pipe has an enlarged bell portion at one end which forms a socket for receiving the spigot end of the barrel portion of the next length of pipe in an installation of a line of such pipe.

All concrete pipe must be reinforced with a steel reinforcing element for structural strength. The reinforcing element customarily used is a "cage" of steel wire around which the concrete is poured in a mold. Two general methods are used in fabricating the reinforcement cage. The most common method is to roll a flat piece of pre-welded wire mesh into a cylinder. The second method involves the use of a "cage machine" that mechanically shapes and welds steel wire into a finished cage, bypassing the intermediate step of mesh fabrication.

Welded wire mesh is manufactured by welding multiple cross ("weft") wires to multiple longitudinal ("warp") wire to form a right-angled lattice structure. Such mesh had been used for many years prior to the Francois Patent as reinforcement

for concrete pipe of both the uniform diameter type and the bell and spigot type. Unlike pipe of uniform diameter, however, bell and spigot type pipe requires a reinforcement cage with a larger circumference at the bell end. Trial and error experimentation long ago demonstrated that ordinary welded wire mesh, with its straight ("rectilinear") wire threads, cannot be stretched to enlarge the circumference at the bell end of the cage without breaking the welds of the mesh.

In order to achieve a reinforcement cage constructed of welded wire mesh for bell and spigot pipe prior to the Francois patent, mesh intended for use in bell and spigot pipe was manufactured with the cross wires of such length that along one edge of the mesh, they projected several inches beyond the last longitudinal wire. When this mesh was cut to the proper length and rolled into cylindrical shape to form a cage, the extra-long cross wires would project at one end of the resulting cage. The cage was then completed for use in bell and spigot pipe by bending, with a hand tool, each of the individual projecting wires outwardly and then back into parallel position relative to the axis, and welding a separately formed wire hoop of large diameter to the projecting wires (Plaintiffs' Exhibit No. 21), welding a basket of two or more wire hoops of larger diameter to the projecting wires (Plaintiffs' Exhibit No. 22), or welding a series of pieces of wire to the projecting wire ends and to each other (Plaintiffs' Exhibit No. 28).

The methods for making a bell and spigot cage from wire mesh outlined in the preceding paragraph entail two distinct disadvantages. The first is the time required to complete the bending and welding operations by hand. It takes a skilled welder approximately one minute to complete the bending and welding on each cage. The second disadvantage is the lack of uniformity and quality assurance in the resulting product. Because the bending and welding of the bell end is done manually, there is no way to assure that the bell-end hoops are concentric with the barrel of the cage and perpendicular to its axis. Deviations in these aspects are particularly undesirable for two practical reasons. First, a cage with a poorly shaped

bell, when placed bell end down within the pipe mold, will not be properly centered in the concrete wall of the pipe and consequently will not provide proper reinforcement in accordance with industry standards. Second, a freshly made pipe, thrown out of balance by an off-center cage, can tip over when stood on end for curing. That pipe as well as pipes that may be knocked over will be spoiled.

Prior to the Francois patent, the only practical alternative to the manual method of making bell and spigot cages from wire mesh was the cage machine. As stated above, a cage machine mechanically shapes and welds steel wire into a finished cage, bypassing the need for pre-welded wire mesh. Problems relating to lack of uniformity in production are greatly reduced by the cage machine method. A cage machine, however, entails a much higher capital outlay; each machine requires an initial investment of approximately $300,000.00 and may cost as much as $50,000.00 per year to maintain.

Despite their high costs, cage machines began making inroads in the concrete pipe manufacturing industry during the 1960s, primarily due to the problems associated with the unreliability of the manual method of constructing bell and spigot cages from wire mesh. The difficulties with the latter method were recognized as so serious that the Wire Reinforcement Institute, a trade association made up of wire mesh manufacturers, set up a special task force in 1967 to try to devise new means or methods for achieving a high degree of quality and uniformity with the use of wire mesh.

The Francois patent (Plaintiffs' Exhibit No. 1) discloses the production of cages for bell and spigot pipe from wire mesh of a particular novel construction wherein a small number (shown as two) of the longitudinal (warp) wire along one edge of the mesh have deformed portions such that although they have the same apparent length as the other (straight) warp wires in the mesh, their actual length is substantially greater. The Francois patent states that the deformed portions of the warp wires may be "either in the form of corrugations as shown, or in the form of folds, loops or other sinuosities or convolutions located in the plane or outside the plane of the lat-

tice." The specific example in the patent describes these wires as having sinusoidal convolutions whose pitch or wavelength was 30 mm. and whose amplitude was of the order of 10 mm., and therefore being roughly 60 percent greater in actual length than the other warp wires.

In carrying out the method of the Francois patent, a panel of mesh of the characteristics described in the preceding paragraph is rolled into a cylindrical cage of the desired diameter, and the ends of each warp wire, including each convoluted wire, are welded together to form circular rings. The end of the resulting cylindrical cage where the convoluted wires are located is then expanded radially to the proper diameter for the bell portion of the pipe in which the cage is to be used. During this expanding step, the convoluted wire rings are elongated as their convolutions partially straighten, and the end portions of the weft wires to which they are welded are bent outwardly to match the increase in diameter of the convoluted wire rings. The expansion of the convoluted wires is achieved "by means of a known apparatus, such as an expansible mandrel controlled by hydraulic pneumatic or mechanical means." (Plaintiffs' Exhibit No. 1).

The method of the Francois patent thus employs the conventional steps of the prior art in the initial formation of the cage, namely, rolling the pipe mesh to cylindrical form and welding the overlapping ends of the circumferential (warp) wires together. But its remaining step, expansion of the convoluted wire end of the cage to the proper size to fit the socket portion of the pipe, is carried out by an automatic machine. The expansion can be completed in about five seconds, as compared with one minute for the manual bending and welding of a socket by a skilled workman, and it achieves a uniform, perfectly positioned bell-end reinforcement.

In 1969, a "study mission" comprised of approximately thirty American industry leaders sponsored by the American Concrete Pipe Association toured concrete pipe manufacturing facilities in Europe to observe the latest technologies being employed there. Among the members of that study mission were Emerson W. Heisler, now Vice President of Price

Brothers, and John C. Merritt, now Vice President and General Manager of the Construction Materials Division of defendant Reliance, both of whom appeared as witnesses at the trial. Heisler observed the method described by Francois in use at a pipe plant in France and was immediately impressed with its potential. As a civil engineer employed in the steel mesh reinforcement industry since 1954, Heisler was well aware of the problems involved in the reinforcement of bell and spigot pipe. He testified that his initial observation of the Francois method "was almost like stumbling over gold. . . . It looked so much like the answer to a long festering problem." (Tr. Vol. I, p. 44). Heisler learned from the manager of the French plant that the wire mesh with convoluted wires was manufactured in France by plaintiff Trefilunion. Within days he began negotiations with Trefilunion that eventually resulted in the acquisition by Price Brothers of exclusive license rights for the entire United States and its possessions by March, 1971.

Price Brothers began the manufacture and use of pipe mesh in accordance with the Francois patent early in 1971. It adopted and began to use the trademark "FLEXICAGE" for that pipe mesh on April 20, 1971, and it subsequently obtained United States Trademark Reg. No. 945,050 thereon on October 17, 1972.

The method embodied in the Francois patent, which at trial was referred to as the "Flexicage method," enjoyed prompt and widespread acceptance in the United States' concrete pipe industry. Price Brothers began offering sub-licenses to other manufacturers of pipe mesh in the summer of 1971, and by the time this lawsuit was filed in 1979, sub-licenses had been granted to virtually every manufacturer of welded wire pipe mesh for bell and spigot pipe in the United States.

EWP was incorporated as a subsidiary of Price Brothers on February 1, 1979. On March 1, 1979 Price Brothers assigned to EWP all of its rights in its agreements with Trefilunion and all of the licenses it had granted which were then in force. Every license granted by Price Brothers or EWP under the Francois patent required a license fee of $10,000, and all require

royalties equal to 1.5% of the licensee's net selling price of welded wire pipe fabric having convoluted longitudinal wires along one edge of the fabric ("Expandable Pipe Mesh"). All licenses also extend to the licensee's customers the right to use the licensed Expandable Pipe Mesh for its intended purpose, and all licenses also include the right to use the trademark "FLEXICAGE" on the licensed Expandable Pipe Mesh. Heisler testified that as of the time of the trial, he knew of no United States manufacturer of pipe mesh for bell and spigot pipe which did not use the Flexicage method, and that Exposaic is the only such manufacturer which does not pay royalties thereon under the Francois patent. No evidence to the contrary was offered by the defendants.

In addition to the United States patent, the Francois invention has been the subject of patents issued in 27 foreign countries.

II. NONOBVIOUSNESS

A. Scope of the Issue

Defendants contend that the Francois patent is invalid because it lacks the essential characteristic of *obviousness*. Under 35 U.S.C. § 103, an invention is unpatentable if

> the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Id. The issue of obviousness is ultimately a question of law which lends itself to several basic factual inquiries. In the seminal case of *Graham v. John Deere Co.*, 383 U.S. 1 (1966), the Supreme Court outlined the proper scope of these inquiries as follows:

> [T]he scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary

> skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined.

Id. at 17. Continuing, the Court stated:

> Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.

Id. at 17-18. In all cases the question of obviousness turns primarily on a technical comparison, the issue being "whether the difference between the prior art and the subject matter in question 'is a difference sufficient to render the claimed subject matter unobvious to one skilled in the applicable art. . . .' " *Dann* v. *Johnston*, 425 U.S. 219, 228 (1976) [citation omitted]; *Eltra Corp.* v. *Basic, Inc.*, 599 F.2d 745, 751 (6th Cir. 1979). "Secondary considerations" are not determinative, but may serve to "tip the scales" in favor of patent validity where the question of technical obviousness is close. *American Seating Co.* v. *National Seating Co.*, 586 F.2d 611, 622 (6th Cir. 1978); *General Motors Corp.* v. *Toyota Motor Co., Ltd.*, 467 F. Supp. 1142 (S.D. Ohio 1979), *aff'd in part and rev'd in part*, 667 F.2d 504 (6th Cir. 1981).

Every patent issued by the Patent and Trademark Office is accorded a statutory presumption of validity. 35 U.S.C. § 282.[1] This presumption has no independent evidentiary

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[1] Section 282 provides in party as follows:

> A patent shall be presumed valid. Each claim of a patent (whether in independent, dependent, or multiple dependent form) shall be presumed valid independently of the validity of the other claims; dependent or multiple dependent claims shall be presumed valid even though dependent upon an invalid claim. The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity.

35 U.S.C.A. § 282 (Supp. 1983).

value, but merely serves to allocate the burden of proof to the party asserting invalidity. *Eltra Corp.* v. *Basic, Inc., supra,* 599 F.2d at 750; *Reynolds Metals Co.* v. *Acorn Building Components Inc.*, 548 F.2d 155, 160 (6th Cir. 1977); *Dickstein* v. *Seventy Corp.*, 522 F.2d 1294, 1296 (6th Cir. 1975), *cert. denied,* 423 U.S. 1055. Defendants here contend that the Francois invention was obvious in light of several prior art references that the United States Patent and Trademark Office failed to consider. In particular, defendants rely on eight prior patents and one unpatented process described in industry publication, none of which were cited by the patent office with respect to the Francois patent. Where, as here, the bulk of defendants' evidence consists of prior art disclosed by documents of unchallenged authenticity, defendants must prove their claim of obviousness by a preponderance of the evidence. *Saginaw Products Corp.* v. *Eastern Airlines, Inc.*, 615 F.2d 1136, 1140 (6th Cir. 1980); *Eltra Corp.* v. *Basic, Ind., supra,* 599 F.2d at 750; *Dickstein* v. *Seventy Corp., supra,* 522 F.2d at 1295-97.

A threshhold question exists in this case as to whether the prior art references relied on by defendants are "pertinent." The most pertinent prior art in this case is clearly embodied in the methods used prior to the Francois invention in manufacturing reinforcements for concrete bell and spigot pipe, which have been described above. As will be seen, however, most of the prior art relied on by defendants does not relate specifically to concrete bell and spigot pipe.

Prior art is pertinent for purposes of § 103 if its elements, problems or purposes are reasonably analogous to those of the claim in suit. *Skega Aktiebolag* v. *B. F. Goodrich Co* 420 F.2d 1358, 1359 (6th Cir. 1970). Stated otherwise, pertinent prior art is that prior art which a person of ordinary skill in the art could reasonably be expected to consult in developing the invention. *See Smith* v. *Acme General Corp.*, 614 F.2d 1086, 1093 (6th Cir. 1980); *Digitronics Corp.* v. *New York Racing Ass'n Inc.*, 553 F.2d 740 (2d Cir. 1977).

As noted, the purpose of the Francois invention was to provide an improved method of fabricating from pre-welded steel

wire mesh a reinforcement for tubular concrete elements, such as bell and spigot pipe, having an end socket. The essential problem involved was to find a means of manipulating and shaping the reinforcing material into a rigid tubular cage having two different diameters, a smaller diameter for the long "barrel" portion of the pipe and a larger diameter for the socket end of the pipe. An inventor grappling with this problem could reasonably be expected to consult not only the prior art dealing directly with concrete bell and spigot pipe, but also prior art involving similar problems and elements, including techniques for reinforcing concrete structures of various shapes and methods involving manipulation of steel wire mesh. To the extent that the prior art relied on by defendants is reasonably analogous in such respects, it must be considered in determining the issue of obviousness.

With this in mind, the Court now turns to an examination of the prior art references introduced by defendants.

B. Findings Concerning the Content of the Prior Art Cited by Defendants, Pertinence to and Differences from the Patent in Suit.

1. The Emerson and Midgley Patents.

United States Patent Nos. 386,304 and 386,306 [the "Emerson and Midgley patents"] (defendants exhibits I and J), issued in 1888, claim an improved type of flexible hose reinforced with a fabric of interwoven wire links and a method for manufacturing such hose. The process patent discloses a method of fabricating a flexible wire tube by interweaving many separate helically coiled wire strands into a seamless tube-shaped structure, and then pushing a mandrel through its cavity, thus exerting an outward force upon the wire coils which flattens them into links.

The differences between the Emerson and Midgley patents and the patent in suit are many. First, these patents have nothing to do with concrete reinforcement, but rather pertain to flexible hose covered with rubber. The purpose of the wire

reinforcement is to resist high hydraulic pressure within the hose, whereas the purpose of the reinforcement in concrete pipe is to provide tensile strength to the concrete. The Emerson and Midgley patents do not use pre-welded wire mesh, but rather use separate wire coils interwoven like chain mail; thus, one of the central problems addressed by the Francois patent, the breaking of welds in a pre-welded mesh, is entirely absent. The Emerson and Midgley patents disclose a flexible, relatively small diameter hose whose diameter is uniform along its entire length; thus, one major purpose of the Francois patent, to make a reinforcement having different diameters, is also absent. While there is a slight deformation of the wire threads in the Emerson and Midgley patents, this deformation is intended neither to produce a significant increase in the diameter of the tube nor to produce differing diameters in one length of tube. The resulting tube is flexible and could not be used as a reinforcement for concrete bell and spigot pipe, which requires a rigid cage.[2] In short, the Emerson and Midgley patents have little or no pertinence to the Francois patent.

2. The Raymond Patent.

United States Patent No. 803,852 [the "Raymond patent"] (defendants' exhibit K), issued in 1905, claims ten similar combinations of concrete and metal reinforcement. The novel element common to each of the claims is a reinforcement consisting of a metal "rod, bar, or wire" bent into a series of non-helical loops. When embedded in concrete, the looped rods cannot be stretched without crushing the concrete inside the loops. The looped reinforcement is thus intended to provide increased tensile strength by taking advantage of the compression strength of concrete.

The Raymond patent does not use pre-welded wire mesh or lattice. It does not involve any expansion of the looped rods for the purpose of altering the shape of the reinforcement. It does

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[2] *See* AWWA Standards for Reinforced Concrete Water Pipe — Non-cylinder Type, Not Prestressed (Defendants' Exhibit R) at p. 9.

not describe any means of constructing a reinforcement for a concrete pipe having differing diameters or having a socket end. Its purpose is entirely different from that of the Francois patent, and its pertinence thereto is slight.

3. The Thun Patent.

United States Patent No. 939,567 [the "Thun patent"] (defendants' exhibit L), issued in 1909, also claims several particular combinations of concrete and metal reinforcement. The novel element disclosed is the use of a reinforcing material made of braided wire fabric. According to the specifications of the Thun patent, this braided wire fabric permits two improvements in the reinforcement of concrete. First, it is described as giving added strength to the concrete structure because "distortion of its form or loosening of its union with the covering cannot occur without crushing the concrete which fills its interstices. . . ." *Id.* This aspect of the invention is thus similar in principle to the looped rods disclosed in the Raymond patent, *supra*.

Second, the braided fabric "is also capable, when desired, of being adjusted as to size and shape as required for different purposes, preliminary to applying the concrete covering to form the completed structure." *Id.* The drawings appended for illustrative purposes show a cylindrical or tubular reinforced concrete structure which is bent in an elbow shape and which varies in diameter, being narrower at one end. Thus, this aspect of the Thun invention is arguably pertinent to the problem of achieving an alteration in diameter of a cylindrical metal reinforcement.

The specific way in which the Thun invention allows for changes in the diameter of the reinforcement is quite different from the Francois invention, however, The wire fabric of the Thun patent is not pre-welded lattice mesh, but rather consists of unwelded, interwoven wires which can move in relation to each other. In changing the shape of the fabric, the individual wires are not expanded or stretched, but rather are moved closer to or farther apart from each other. Thus, the basic

principle involved is fundamentally dissimilar to that of the Francois invention. None of the wires in the Thun wire fabric are convoluted or corrugated. There is no disclosure of a mechanical expansion of the fabric. While the drawing show that the diameter of the fabric tube can be compressed, they do not show expansion, and it appears that the extent of possible expansion is very limited.

4. The Boyle Patent.

United States Patent No. 1,158,415 [the "Boyle patent"] (defendants' exhibit M) issued in 1915, claims an improvement in concrete bell and spigot pipe. Specifically, the improvement consists of a particular construction of the bell and spigot ends, such that the spigot end has a groove in its outer circumference and the belly socket has a groove in its inner circumference. When the spigot end is fitted into the bell end of an adjoining section of pipe, these grooves form a channel that may be filled with a liquid cement, thus forming a sealed joint between the two pipe segments. The Boyle patent further discloses the placement of "metal loops" embedded in the concrete wall of the pipe and extending into the grooves to provide reinforcement for the cement seal.

These disclosures, which comprise the essential purposes of the invention, in and of themselves shed no light on the reinforcement of the bell portion of the pipe. The specifications and drawings of the Boyle patent do make reference to longitudinal and circumferential "corrugated reinforcing rods," with the longitudinal rods projecting at an angle into the bell and the circumferential rods "extending around the said [longitudinal] rods." *Id.* Defendants contend that these words anticipate the use of "corrugated" warp wires in the Francois patent. The Court finds otherwise, however. The word "corrugated" is not defined in the Boyle patent, but expert testimony at trial conclusively establishes that it referred to ordinary straight metal rods having a rough surface for improved adhesion to concrete. Furthermore, all the rods in the illustrated pipe, including the straight longitudinal rods, are described as "corrugated." The Boyle patent makes no

reference to any expansion of corrugated rods. There is nothing to indicate how the rods are held together or positioned in the concrete. There is no mention of pre-welded mesh or lattice. There is no teaching with respect to how the rods are bent in the bell socket. The Court therefore finds that the Boyle patent, which is the only prior art reference cited by defendants that relates specifically to concrete bell and spigot pipe, discloses nothing pertinent to the formation of a reinforcement having a socket beyond that which was evident in the manual methods used in the art prior to the Francois invention.

5. The Beeby Patent.

United States Patent No. 1,476,584 [the "Beeby patent"] (defendants' exhibit N), issued in 1923, claims an improved "protected pile" and a process for making it. The pile consists of a wooden pole sheathed in concrete. The purpose of the sheathing, as expressed in the patent specifications, is to provide protection against destruction by the Teredo worm when the pile is used in saltwater.

The sheathing consists of a wire lattice reinforcing cage, which is formed around and secured to the wooden pile, and a covering of concrete. In order to provide a smooth, angled joint between the wood and the concrete at the bottom edge of the sheathing (to make it easier to drive the pile into the earth without dislodging the sheathing), the sheathing is tapered inwardly and seated within a notch cut into the wooden pile. The patent teaches that the reinforcing lattice can be tapered at the bottom edge by crimping the bottom circumferential wire at several points and bending it into the notch.

The Beeby patent makes no reference to bell and spigot pipe or concrete pipe of any kind. The purposes of sheathed wooden piles and bell and spigot pipe are obviously quite dissimilar, and this dissimilarity draws into question the pertinence of the reference. The Beeby patent does, however, involve a cylindrical concrete structure, a pre-welded wire lattice reinforcement, and a method of altering the diameter of

the reinforcement at one end. In these respects it may be considered pertinent art.

The method of shaping the lattice reinforcement disclosed by the Beeby patent differs from the Francois invention in several important ways. The change in the diameter of the reinforcement is a compression, and not an increase. Whereas the Francois patent discloses the stretching of pre-deformed wires, the Beeby patent discloses the crimping of straight wires; thus, they work in exactly opposite fashion. While the crimping disclosed by the Beeby patent accomplishes the purpose sought therein, it cannot be used to increase the diameter of the reinforcement because the wires are not convoluted.

6. The German Patent.

German Patent No. 694,086 [the "German patent"] (defendants' exhibit O), issued in 1937, described a process for "Production of Hollow Concrete Bodies." It discloses a method of reinforcing a tubular or hollow conical concrete structure by means of a wire reinforcement whose transverse or circumferential wires are either overlapped at the ends or corrugated, and thus "extensible." The German patent, like the Francois patent, further discloses the use of a mechanical means, i.e., a mandrel, to exert radial force upon the circumferential wires for the purpose of stretching them.

There are significant differences between the German invention and the Francois invention. The German process is concerned with the manufacture of hollow concrete bodies by the press method, and the object of the patent is to solve the problem of keeping the reinforcement in place in the center of the concrete wall during pressing. The method consists of three steps: first, an outer wall of concrete is poured; second, the wire reinforcement is pressed into the inside surface of the outer concrete wall by means of the mandrel; and third, an inner wall of concrete is poured and pressed. Unlike the Francois patent, the German patent discloses nothing with respect to the formation of a socket or bell. All of the circumferential wires are corrugated (or overlapped) and expanded to the same extent. The expansion is slight — merely enough to press

the longitudinal rods into the wet outer concrete wall — and is not intended to result in any change in the diameter of the concrete body. In addition, the expansion of the reinforcement wires necessarily takes place between two separate pourings of concrete, whereas the Francois method is begun and finished before any concrete is poured. Notwithstanding these differences, the German patent shares enough similar elements with the subject matter of the Francois patent to be considered pertinent art.

7. The French '091 Patent.

French Patent No. 1,241,091 (defendants' exhibit P), issued in 1960, claims an improved type of gabion constructed of pre-welded wire "grill-work" or mesh in which the wires contain deformations so as to permit changes in overall shape. Gabions are large wire baskets which are filled with rocks, closed on all sides, and placed along riverbanks or inclines to prevent erosion or earthslides. This patent claims to improve the gabion by making its wire mesh wall deformable, and hence adaptable to irregular earth surfaces. This "deformability" is made possible by construcing the gabion basket of welded wire mesh that has deformations in either or both the warp and weft wires between the welded crossing points. In theory, the downward force of the rocks inside the basket or the upward force of irregular protuberances in the surface upon which the basket is placed will stretch the deformed wires and permit adaption in shape.

The French '091 patent and the Francois invention share two similarities; both use pre-welded wire mesh lattice, and both rely on the principle that a pre-deformed wire can be straightened, and thus stretched. Beyond these commonalities, however, the two inventions are completely different. Unlike the Francois patent, the French '091 patent has nothing to do with concrete pipe or concrete reinforcement at all. It makes no reference to the formation of a socket or bell end cage. The problems and purposes of the French '091 patent are essentially dissimilar to those of the patent in suit, and it has little or no pertinence.

8. The French '698 Patent.

French Patent No. 1,474,698 (defendants' exhibit Q), issued in 1967), relates to "reinforced concrete construction elements of any nature, in particular plates, supports, beams, or analogous elements, composed of several steel bars placed in the construction elements and connected together by wires, bars or straps." *Id.* The invention consists of prefabricated reinforcing elements designed such that

> the two immediately adjacent reinforcing elements, such as, for example, bars, rings, lattices, or reinforcing ladders, are interconnected at a distance which can be varied, this connection being made by means of support and linking elements. . . .

Id. The "linking elements" are described as flexible metal wires or straps which can be affixed to the reinforcing elements by welding, crimping, tying, or other appropriate means. The patent further specifies that these linking elements "can be folded in a zigzag form so as to be more or less stretched according to the desired distance between the reinforcing bars." *Id.*

Figure 19 in the drawings accompanying the specifications shows a reinforcement for concrete pipe which exhibits the application of the invention. The figure shows a number of parallel, circular reinforcing rings interconnected with slanted linking wires. If the rings are twisted, the angle of the linking wires changes. By this manipulation, the distance between any two adjacent rings, and thus the axial length of the entire pipe reinforcement, can be increased or decreased within limits. There is sufficient similarity between the purposes and elements of this patent and those of the Francois patent to make the French '698 patent pertinent. There are also significant differences, however.

Whereas the French '698 patent teaches the use of a prefabricated reinforcement consisting of separate reinforcing elements connected by flexible "linking elements," the Francois patent uses one piece of pre-welded wire mesh, and there

are no linking elements as such. The linking elements, which may be "zigzag" in the French '698 patent, serve to permit a modification in the distance between the main reinforcing elements and to hold them in position; they therefore serve a different purpose than the convoluted wires in the Francois invention. More importantly, the French '698 patent describes a pipe reinforcement that can be increased or decreased in length only. There is no reference to a socket or bell, nor does the patent describe any means of changing the diameter of a concrete pipe reinforcement. Neither the circumferential rings nor the slanted linking wires in the pipe reinforcement illustrated are capable of being expanded radially to form a socket.

9. The Joint Ring Manufacturing Method.

The final prior art relied on by defendants is disclosed by defendants' exhibits R, S and T and the testimony of Messrs. Merritt and Heisler. It is a method for fabricating steel joint rings for large diameter concrete pipe that had been practiced in the concrete pipe industry for many years prior to the Francois patent.

Joint rings are bands of steel which, with the addition of a rubber gasket, provide a water-tight seal between two connected sections of concrete pipe. In the prior art a joint ring is formed by bending a long, flattened steel bar into a circular band and welding the ends together. In order to achieve a precise fit between two sections of pipe, the joint rings must be accurately shaped. For this purpose the welded steel ring is placed on a press that exerts great (40,000 p.s.i.) outward radial force, expanding the ring beyond the natural elastic limits of the steel in order to achieve near-perfect circularity. The actual increase in the diameter of the ring resulting from this application of force is very slight, on the order of 1/32 of one inch in a 24 inch diameter ring.

This method is easily seen to differ from the Francois invention in the following respects: the product is not used as a concrete reinforcement; the material expanded is a thick steel band, as opposed to a thin wire; the steel band is not cor-

rugated or deformed in any way; expansion of the ring is very slight and is not intended to result in any significant increase in the ring's diameter. The problems, purposes, materials and resulting product of this method are dissimilar from those found in the Francois method, and its pertinence is slight.

C. Findings Concerning the Level of Ordinary Skill in the Art.

Neither plaintiffs nor defendants sought to establish the level of ordinary skill in the art by expert opinion testimony. The Court may, however, infer the level of ordinary skill from an examination of the evidence relating to the scope and content of the prior art. *See Blohm & Voss* v. *Prudential-Grace Lines, Inc.*, 489 F.2d 231 (4th Cir. 1973), *cert. denied*, 419 U.S. 840; *Burgess Cellulose Co.* v. *Wood Flong Corp.*, 431 F.2d 505 (2d Cir. 1970).

The art involved in this case is neither esoteric nor highly complex. It involves the application of basic principles of concrete reinforcement and requires familiarity with the physical characteristics of the materials used. In addition, it requires some familiarity with industry construction standards and methods of commercial production. This knowledge base is no doubt outside the common experience of most laymen, who are probably ignorant of the compression strength of concrete, the tensile strength of drawn steel wire, industry standards for welded reinforcements, and the like. In general, the hypothetical person of ordinary skill in this art would be a person with some post high school education in mechanical or civil engineering and several years' practical experience in the field of manufacturing reinforced concrete products.

D. Technical Considerations; Expert Testimony; Secondary Considerations.

It cannot be denied that the Francois invention is strikingly simple. Yet, simple and obvious are not synonymous terms. It is perceived that the invention depends for its successful operation upon two simple principles: a steel wire of a given

length can be deformed or bent into a smaller apparent length, and then later be stretched back closer to its original length; and further, if the deformed wire is bent into a circle before it is stretched, the stretching will result in a circle with a larger diameter. Of all the prior art references relied on by defendants, the German '086 patent clearly exhibits the greatest similarity to the Francois invention. As noted, the German patent discloses a wire lattice reinforcement for concrete whose circumferential wires are corrugated, and thus "extensible." The German patent, like the Francois patent, then discloses the use of a mandrel to exert radial force upon these circumferential wires for the purpose of stretching them and expanding their circumference. These aspects of the German patent and the Francois patent are thus, in principle, the same.

As the Court has also found, however, the purposes served by the expansion of the circumferential wires and the resulting structures in the German patent and the Francois patent are quite different. The German patent discloses expansion of the reinforcement along its entire length in order to press it into the wet outer wall of a hollow concrete tube or cone. There is no disclosure of a socket of increased diameter at one end, and in fact, the application of the German process could not result in the formation of a socket. In view of this difference, the question of obviousness can be stated in a more specific way: Would it have been obvious to a person of ordinary skill in the art, who is presumed to have been familiar with the German patent and the other pertinent art of record in 1968, that the method disclosed in the German patent could be modified to prefabricate a tubular lattice reinforcement having a socket of increased diameter at one end?

In the opinion of plaintiffs' expert rebuttal witness, Walter Starkey, Ph.D., the answer to the above question is "no."[3]

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[3] Defendants objected to the admission of Dr. Starkey's opinion on this issue on the ground that the opinion concerned an ultimate issue in this case. (TR. Vol. II, pp. 80-81). However, Rule 704 of the Federal Rules of Evidence provides that

Dr. Starkey was well qualified to express an opinion on this issue by reason of his extensive education and experience. He has a doctoral degree in mechanical engineering and has taught engineering and design for over 30 years. He is fully familiar with concrete, concrete reinforcement and methods of manufacturing concrete pipe. Unlike the other witnesses who testified at trial, all of whom are employed by the parties to this action, Dr. Starkey has no personal interest in the outcome of this lawsuit. Dr. Starkey supported his opinion with extensive analysis of the prior art relied on by defendants. His conclusions were substantially in accord with the Court's own findings. He considered the question of obviousness in this case in light of thirteen separate factors,[4] and concluded that the Francois invention would not have been obvious to an average workman skilled in the pertinent arts and sciences.[5]

In contrast to Dr. Starkey, defendants' expert, Harold Woltz, testified that he believed the German process and the Francois process are "identical."[6] Mr. Woltz is employed as president of defendant Exposaic, has a bachelor's degree in business administration, and apart from a high school course in mechanical drawing, has no formal education in science or engineering. Because of Mr. Woltz's lack of qualifications and potential bias, the Court gives no weight to his opinion.

> [t]estimony in the form of an opinion or inference otherwise admissible is not objectionable because it embraces an ultimate issue to be decided by the trier of fact.

[4] Those factors were (1) Purpose, objective, function of the invention; (2) Basic idea, or ideas; (3) Basic laws of physics applied; (4) Engineering principles applied; (5) Mechanism, i.e., the plan by which (2), (3) and (4) are applied to accomplish (1); (6) Type of end product; (7) Configuration, arrangement of parts; (8) Shapes of individual parts; (9) Sizes of individual parts; (10) Materials used for individual parts; (11) Processes of manufacture of individual parts; (12) Process of assembly; and (13) Amount of ideation-imagination required to go from prior art to new invention. (Plaintiffs' Exhibit 58).

[5] Tr. Vol. II, pp. 83-84.

[6] Tr. Vol. I, p. 178.

Of course, the Court is not bound by Dr. Starkey's conclusion on the issue of obviousness, and would be obliged to reject it if the Court's independent examination of the evidence indicted that his conclusion is erroneous. However, the Court agrees that the prior art relied on by defendants was dissimilar enough to render the Francois invention nonobvious. Moreover, this conclusion is supported by other factors shown by the evidence which, while not controlling, provide relevant indicia for a finding of non-obviousness.

There is convincing evidence that the Francois invention filled a long felt and serious need in the reinforced concrete pipe industry. As noted, the wire mesh industry formed a special task force for the specific purpose of finding a solution to the problems inherent in the old methods of cage fabrication. This followed attempts by Price Brothers and other manufacturers to develop a method of stretching pipe mesh by mechanical means. Those prior attempts failed because it was found that the wires of ordinary rectilinear wire mesh could not be stretched without breaking the welds.

Once the Francois process was introduced into this country by Price Brothers, the impact upon the American concrete pipe industry was immediate and extensive. Within several years virtually every manufacturer of wire mesh for bell and spigot pipe in the United States sought and obtained a license. The prior art methods of bending and welding bells on reinforcement cages by hand were soon entirely supplanted. Many manufacturers of concrete bell and spigot pipe that had invested heavily in the expensive cage machine technology abandoned it in favor of the Francois method. At the time of trial, defendant Exposaic was the only manufacturer of wire pipe mesh in the United States that challenged the validity of the patent and stopped paying royalties.

Of all the prior art references introduced by defendants on the issue of obviousness, defendants rely most heavily on three patents as the most pertinent art: the German patent, the Boyle patent, and the Beeby patent. The most recent of these, the German patent, was issued in 1940. The Boyle patent and the Beeby patent were issued in 1915 and 1923, respectively.

If the subject matter of the Francois method, taken as a whole, would have been obvious to a person of ordinary skill in the pertinent art in light of these patents, the question naturally arises as to why it wasn't developed sooner. The evidence indicates that the concrete pipe industry is highly competitive. Certainly the problems associated with the prior art methods of bell and spigot cage fabrication were well known and easily analysed. The Francois method could not have been overlooked for want of motivation or effort. The sum of the temporal and commercial circumstances surrounding the success of the Francois invention provides persuasive evidence in this case that the invention was not obvious.

To summarize, the Court finds that none of the prior art references relied on by defendants is the most pertinent prior art with respect to the subject matter of the patent in suit. To the extent the references relied on by defendants are pertinent, they are sufficiently dissimilar from the subject matter of the patent in suit to render the latter nonobvious. Defendants' evidence fails to overcome the presumption of patent validity. Moreover, the conclusion that the Francois patent was nonobvious is persuasively supported by the expert testimony of plaintiffs' rebuttal witness and by relevant secondary considerations.

III. INFRINGEMENT

Defendant Exposaic manufactures and sells steel wire reinforcing materials, including welded wire mesh for use in concrete products. It does not itself manufacture concrete pipe. Exposaic obtained a license from Price Brothers to manufacture and sell Flexicage Expandable Pipe Mesh in September, 1975. While Exposaic's license remained in effect, defendant made royalty payments thereunder on more than $2,500,000 in net sales of expandable mesh in the following amounts:

1975	$ 330
1976	$ 4,263
1977	$ 9,248

1978	$20,097
1979	$ 3,566

In the spring of 1978 Exposaic sought the opinion of a patent lawyer concerning the validity of the Francois patent. That lawyer advised Harold Woltz, president of Exposaic, that in his opinion the patent was invalid and recommended termination of the license. In a letter dated November 21, 1978, Woltz notified Price Brothers that it was terminating the license agreement effective ninety days thereafter.

After terminating the license agreement, Exposaic has continued to manufacture and sell expandable pipe mesh that is identical in every respect to the product it formerly sold under Price Brothers' "Flexicage" trademark. This product, now sold under the tradename "Expo Flex Wire Bell Reinforcement," is distributed to manufacturers of concrete bell and spigot pipe including defendant Reliance. On cross examination, Mr. Woltz testified that the expandable mesh may be used by customers for purposes other than bell and spigot pipe. When pressed on this point, however, Woltz could think of only one customer who had used the expandable mesh in non-bell and spigot pipe for inventory reduction purposes. He further conceded that the "vast majority" of purchasers use it in the manufacture of bell and spigot pipe using the patented Francois method.[7] Since terminating the license agreement, Exposaic has not actively advertised or publicized Expo Flex expandable mesh. It manufactures the product according to the purchaser's specifications, and claims to have no interest in what the purchaser uses it for. There can be no doubt, however, that Exposaic's expandable mesh product is manufactured, sold, and used by the defendant's customers for the intended purpose of making reinforcement cages for concrete bell and spigot pipe using the method claimed in the Francois patent. Because the expandable mesh is more expensive than ordinary non-expandable mesh, moreover, it is uneconomical and contrary to normal business practices to use it for any other purpose.

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[7] Tr. Vol. I, pp. 133-35.

Defendant Reliance, a major manufacturer of reinforced concrete pipe, regularly purchases the expandable mesh from defendant Exposaic and uses it for concrete bell and spigot pipe. It is conceded that if the patent is valid, Reliance directly infringes it.

Title 35 United States Code Section 271 provides in pertinent part as follows:

> (b) Whoever actively induces infringement of a patent shall be liable as an infringer.
>
> (c) Whoever sells a component of a patented machine, manufacture, combination or composition, or a material or apparatus or use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer.

Plaintiffs claim that defendant Exposaic is liable under both of these subsections.

To "actively induce" infringement of a patent within the meaning of § 271(b) means, in essence, to aid and abet infringement by another. *Ingersoll-Rand Corp.* v. *Rockwell International Corp.*, 420 F. Supp. 277 (S.D. Fla. 1976); *Burlington Industries, Inc.* v. *Exxon Corp.*, 379 F. Supp 754 (D. Md. 1974); *Engineered Sports Products* v. *Brunswick Corp.*, 362 F. Supp. 722 (D. Utah 1973). It requires two elements: first, some purposeful action in furtherance of an actual infringement by another, and second, knowledge of the likely infringing result. *Ingersoll-Rand, supra; Burlington Industries, supra.*

Exposaic argues that its sales of expandable mesh do not actively induce direct infringement because its role is only "passive," and not "active." In particular, defendant relies on the fact that it no longer actively advertises or recommends its expandable mesh product for an infringing use, but rather

manufactures and sells it only upon the request of a customer and according to the customer's specifications. While Exposaic no longer actively advertises or solicits orders for expandable mesh, it undeniably accepts orders and actively manufactures and delivers the requested product. Its agents, and in particular its president, Harold Woltz, are perfectly aware that the product is especially designed, intended, and in the vast majority of cases actually used for the purpose of fabricating bell and spigot cages in a manner that directly infringes the Francois patent. Exposaic has agreed to indemnify defendant Reliance against liability for direct infringement. It has performed these acts for its own profit. These facts show purposeful, knowing, intentional acts which encourage and aid direct infringement by others. Therefore, assuming the validity of the Francois patent, defendant Exposaic is liable for inducing infringement.

A finding that Exposaic is liabile for inducing infringement under § 271(b) makes it unnecessary to determine whether it is also liable for contributory infringement under § 271(c). In the interests of completeness, however, the Court will also consider defendant's argument in that regard.

A claim of contributory infringement requires that plaintiffs establish (1) that defendant sold a material to be used in the patented process; (2) that said material constituted a material part of the patented process; (3) that defendant knew the material to be especially designed or adapted for use in the infringement of the patent; and (4) that the material did not constitute a staple article suitable for substantial noninfringing use. *Aro Manufacturing Co., Inc.* v. *Convertible Top Replacement Co.*, 377 U.S. 476 (1964); *Sing* v. *Culture Products, Inc.*, 469 F. Supp 1249 (E.D. Mo. 1979). It appears (and defendants do not dispute) that Exposaic and its expandable mesh product meet the first three tests. However, Exposaic contends that its expandable mesh is a staple article suitable for substantial noninfringing use.

Three witnesses at trial familiar with the concrete pipe industry, including plaintiffs' witness Emerson Heisler, testified that the expandable mesh is capable of being used to reinforce

straight, i.e., non-bell and spigot, pipe if the corrugated wires are left unexpanded. The testimony, however, leaves no room to doubt that such use of the product is inefficient, uneconomical and discouraged in the industry. There is no evidence in the record that any manufacturer of concrete pipe has ever purchased expandable wire mesh with the intention of using it for any purpose other than making bell and spigot pipe by the Francois method. If a manufacturer ultimately uses it for some other purpose, such use is aberrant and rare. The Court therefore finds that the expandable mesh sold by Exposaic is not a staple article suitable for substantial noninfringing use. *Cf. Dennison Mfg. Co.* v. *Ben Arnold & Sons, Inc.*, 467 F. Supp 391 (S.D.N.Y. 1979). Accordingly, the Court further finds that defendant Exposaic is liable for contributory infringement.

IV. DAMAGES

Section 284 of Title 35, United States Code, provides in pertinent part as follows:

> Upon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer, together with interest and costs as fixed by the court.
>
> When the damages are not found by a jury, the court shall assess them. In either event the court may increase the damages up to three times the amount found or assessed.

Under this section plaintiffs are entitled as a matter of law to recover damages adequate to compensate them for defendants' infringement of the Francois patent, but in no event less than a "reasonable royalty." Plaintiffs seek to recover a reasonable royalty, the exact amount of which must await later determination following an accounting by defendants.

In addition, plaintiffs ask the Court to rule that they are entitled to recover treble damages under the second paragraph of § 284 on the ground that defendants' infringement was willful.

It is well established that an award of treble damages under § 284 is punitive in nature and can properly be made only upon a showing of willfulness on the part of the defendants, in the sense of deliberate wrongdoing or bad faith. *Baumstimler* v. *Rankin*, 677 F.2d 1061 (5th Cir. 1982); *Saginaw Products Corp.* v. *Eastern Airlines, Inc.*, 615 F.2d 1136 (6th Cir. 1980); *Trio Process Corp.* v. *L. Blumenstein's Sons, Inc.*, 612 F.2d 1353 (3d Cir. 1980); *Leesona Corp.* v. *United States*, 599 F.2d 958 (Ct. Cl. 1979); *cert. denied*, 444 U.S. 991. Where defendants' actions were based on an honest and reasonably debatable doubt concerning the validity of the patent in suit, or upon good faith reliance on the advice of counsel, the requisite element of willfullness is lacking. *See, e.g., Lam, Inc.* v. *Johns-Manville Corp.*, 668 F.2d 462 (10th Cir. 1982), *cert. denied*, 102 S. Ct. 2298; *Deere & Co.* v. *Internat'l Harvester Co.*, 658 F.2d 1137 (7th Cir. 1981), *cert. denied*, 454 U.S. 969; *Eltra Corp.* v. *Basic, Inc.*, 599 F.2d 745 (6th Cir. 1979); *H. D. Porter Co., Inc.* v. *Goodyear Tire & Rubber Co.*, 536 F.2d 1115 (6th Cir. 1976); *Wahl* v. *Carrier Mfg. Co., Inc.*, 511 F.2d 209 (7th Cir. 1975).

In this case, defendant Exposaic gave notice that it believed plaintiffs' patent to be invalid ninety days before it stopped paying royalties. It did so after seeking the advice of a lawyer specializing in patent law. There is no evidence in the record that Exposaic's reliance was not in good faith. Furthermore, the question of patent validity in this case was, in this Court's opinion, reasonably debatable; defendants' claim of obviousness is not so frivolous as to suggest that it was asserted in bad faith. The issues were fairly litigated, and plaintiffs do not suggest otherwise. In view of these facts, plaintiffs have failed to establish that they are entitled to recover punitive damages.

V. CONCLUSIONS OF LAW

1. The Court has jurisdiction over the subject matter of this action. 28 U.S.C. § 1338(a). Personal jurisdiction over the defendants is not contested. Venue is proper in this district. 28 U.S.C. § 1400(b).

2. United States Patent No. 3,578,036 [the "Francois patent"] is presumed valid and the burden of proving invalidity rests with the defendants. 35 U.S.C. § 282.

3. The sole ground upon which defendants claim invalidity of the Francois patent is that the invention was obvious to a person of ordinary skill in the art at the time the invention was made. 35 U.S.C. § 103. Since the bulk of defendants' evidence on this issue consists of documentary evidence of unchallenged authenticity, defendants had the burden to prove their claim of obviousness by a preponderance of the evidence.

4. Prior art is pertinent for purposes of 35 U.S.C. § 103 if its elements, problems or purposes are reasonably analogous to those of the patent in suit. Stated otherwise, pertinent prior art is that prior art of record which a person of ordinary skill in the art could reasonably be expected to consult in developing the invention which forms the subject matter of the patent in suit.

5. Defendants have failed to prove by a preponderance of the evidence that the United States Patent and Trademark Office did not consider the most pertinent prior art when it issued the patent in suit.

6. Having determined the scope and content of the prior art introduced by defendants, its pertinence to and differences from the patent in suit, and the level of ordinary skill in the pertinent prior art, and having considered all other relevant evidence in the record, the Court determines that defendants have failed to prove by a preponderance of the evidence that the invention which forms the subject matter of the patent in suit would have been obvious to a person of ordinary skill in the pertinent prior art at the time the invention was made.

7. The Court concludes as a matter of law that United States Patent No. 3,578,036 is valid.

8. Defendant Reliance Universal, Inc., by its own admission uses the method claimed in the patent in suit, is not directly or indirectly licensed to do so, and therefore is liable for direct infringement. 35 U.S.C. § 284.

9. Plaintiffs have proved by a preponderance of the evidence that defendant Exposaic Industries, Inc., has induced direct infringement of the patent in suit by others, and is therefore liable for inducing infringement. 35 U.S.C. 271(b).

10. Plaintiffs have proved by a preponderance of the evidence that defendant Exposaic Industries, Inc., is liable for contributory infringement. 35 U.S.C. § 271(c).

11. Plaintiffs are entitled as a matter of law to recover damages from the defendants in an amount adequate to compensate plaintiffs for defendants' infringing acts together with interest and costs. 35 U.S.C. § 284.

12. Plaintiffs are entitled as a matter of law to a permanent injunction enjoining defendants from further infringing acts. 35 U.S.C. § 283.

13. Plaintiffs have failed to prove by a preponderance of the evidence that they are entitled to recover increased or punitive damages under 35 U.S.C. § 284.

14. Plaintiffs are entitled to an accounting by defendants.

WHEREUPON, in consideration of the foregoing findings and conclusions of law, it is ORDERED as follows:

1. That defendants, their officers, agents, employees, and all other persons in active participation with them be and are hereby permanently ENJOINED from infringing, inducing others to infringe, or contributing to the infringement of United States Patent No. 3,578,036;

2. That defendants, on or before December 5, 1983, make a full and complete accounting to plaintiffs of all sales, profits and gains relating to the acts of direct infringement, inducing infringement and contributory infringement as found by the Court.

3 That plaintiffs, on or before December 12, 1983, file a

written request for an award of damages based upon the results of the accounting made by defendants. Defendants shall thereafter have ten (10) days in which to file a written response.

IT IS SO ORDERED.

/s/ Joseph P. Kinneary
UNITED STATES DISTRICT JUDGE

COMPARATIVE ANALYSIS OF PETITIONS FOR WRITS OF CERTIORARI COMPLAINING OF *DE NOVO* FACT FINDING BY THE CIRCUIT COURTS OF APPEALS

Circuit	Total Petitions	Petitions on Point	% on Point
1st	107	0	0%
2nd	347	2	0.6%
3rd	334	4	1.2%
4th	231	3	1.3%
5th	397	7	1.8%
6th	320	3	0.9%
7th	292	4	1.4%
8th	204	6	2.9%
9th	574	4	0.7%
10th	143	1	0.7%
11th	353	2	0.6%
DC	175	0	0%
(All circuits combined, excluding CAFC)	3,447	36	1.0%
CAFC	92	9	9.8

The data in this table was compiled using information from the Cases Docketed tables of *U.S. Law Week*, Section 3, Supreme Court Proceedings (hereinafter, *U.S. Law Week)* during the period Nov. 9, 1982 through March 12, 1985, which encompasses U.S.L.W. Vol. 51 No. 18 through Vol. 53 No. 35. The total number of Petitions for Writs of Certiorari emanating from each circuit court of appeals was noted for each issue of *U.S. Law Week* during this time period. Cumulative totals were compiled and all abstracts referencing "5 U.S.C. 706", "Rule 52(a)", "Appellate Fact Finding" or "Appellate Review" were noted. *U.S. Law Week* case summaries were then consulted for each noted case to determine the issues raised. Cases not summarized were checked by reviewing the Petitions for Certiorari on file in the Supreme Court. Cases on point were then tabulated to provide a circuit by circuit breakdown.